COMPARATIVE STUDY OF DIAGNOSTIC ACCURACY OF HYSTEROSCOPY VERSUS TRANS VAGINAL ULTRA SONO GRAPHY IN THE EVALUATION OF ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL AGE GROUP

THIS DISSERTATION IS SUBMITTED

for partial fulfilment of

MS DEGREE EXAMINATION

BRANCH - II

OBSTETRICS AND GYNAECOLOGY

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THENI

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MARCH – 2016

CERTIFICATE

This is to certify that the dissertation named **"COMPARATIVE STUDY OF DIAGNOSTIC ACCURACY OF HYSTEROSCOPY VERSUS TRANS VAGINAL ULTRA SONOGRAPHY IN THE EVALUVATION OF ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL AGE GROUP"** is submitted by **DR.REVATHI.A** to the faculty of Obstetrics and Gynaecology, The Tamil Nadu Dr M.G.R. Medical University, Chennai in the partial fulfilment for the requirement for the award of M.S. degree Branch II Obstetrics and Gynaecology, is a bona fide research work carried out by her under direct supervision and guidance from July 2013- August 2015.

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DECLARATION

I, **DR REVATHI. A** solemnly declare that the dissertation titled **"COMPARATIVE STUDY OF DIAGNOSTIC ACCURACY OF HYSTEROSCOPY VERSUS TRANS VAGINAL ULTRA SONO GRAPHY IN THE EVALUVATION OF ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL AGE GROUP"** has been prepared by me. This is submitted to **The Tamil Nadu Dr M.G.R. Medical University, Chennai** for the partial fulfilment of the requirement for the award of M.S degree Obstetrics and Gynaecology. I also declare that this bona fide work has not been submitted by any others for any award, degree or diploma to any other university or board either in India or abroad.

Place: **DR. REVATHI. A**

Date:

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CONTENTS

INTRODUCTION

Abnormal uterine bleeding (AUB) is the common gynaecological problem, but is complex and difficult to diagnose. It can occur in all age group adolescent, reproductive, peri menopausal and postmenopausal . In peri menopausal women, AUB is diagnosed when there is any change in frequency, duration or amount of bleeding during or in between menstruation. In postmenopausal women, any vaginal bleeding occurring after 12 months of cessation of mensuration is abnormal. The causes of AUB varies in different age group. Main causes in perimenopausal and post menopausal women include anovulation, fibroid, polyps, endometrial hyperplasia, carcinoma of the endometrium, endocervix and atrophic vaginitis.

INCIDENCE:

Abnormal uterine bleeding is responsible for 1/3rd of all out patient in gynaecological clinic. The incidence of AUB in reproductive age group is 10-30%, where as in perimenopausal age group it constitute about 70%, where in post menopausal age group it constitute about 10-12%.AUB is responsible for 2/3rd of all hysterectomies .In Govt. Theni Medical College , abnormal uterine bleeding constitute about 30-40% of all patient attending gynaecological OP. While most of the patient have

benign disease, it is necessary to do thorough investigation in perimenopausal and post menopausal women, where the chances of endometrial carcinoma is about 10-15%.

AIM OF THE STUDY

- To evaluate the accuracy of hysteroscopy compared to Trans vaginal ultrasonography in diagnosing the aetiology of abnormal uterine bleeding.

- To compare the hysteroscopy and trans vaginal ultrasonography findings with histo-pathological specimen of endometrium obtained by hysteroscopic guided biopsies.

REVIEW OF LITERATURE

Various literature has been thoroughly studied, to find out the best method for diagnosing AUB in perimenopausal age group

OLDER TERMINOLOGIES IN AUB[1]

TERM	DEFINITION
Menorrhagia	Regular cycles, prolonged or heavy bleeding
Poly menorrhoea	Frequent cycles (<21days),normal bleeding
Poly menorrhagia	Frequent cycles, heavy bleeding
Metrorrhagia	Inter menstrual bleeding
Oligo menorrhoea	Infrequent cycles(>35days),normal bleeding
Hypo menorrhoea	Regular cycles, light bleeding

FIGO RECOMMENDATIONS ON TERMINOLOGIES

(International journal of Gynaecology and Obstetrics 2011 Malcolm G. Munro)[2]

Over the past decade there are many terms used to describe menstrual symptoms and causes of Abnormal uterine bleeding, which are ill defined and confusing. This led to difficulties in interpreting the scientific and clinical research.

International Workshop in Washington DC in 2005, addressed the issues of confusing terminologies, definition and classification of Abnormal Uterine Bleeding.

The issues also included the quality of life, patient based consideration, cultural issues and controversies in the investigation and management.

It was recommended that confusing terms in Greek and Latin words such as menorrhagia, metrorrhagia and dysfunctional uterine bleeding should be abandoned.

It should be replaced by clear and simple terms that women and men in general community, could be translated into other languages and should be based on statistics derived from population studies.

The recommendations published in Fertility and Sterility and Human Reproduction Journal 2007.[3]

FIGO acceptance by Nov.2009 and published in Feb/April 2011.

ABANDONED TERMS:

- Menorrhagia- Increase in amount and duration of flow is replaced by the term **HEAVY MENSTRUAL FLOW**.

- Metrorrhagia –flow of menstrual bleed in between the cycles , which is replaced by the term **INTER MENSTRUAL BLEED**
- Menometorrhagia –increase in amount and duration of flow with bleeding in between cycles, which is replaced by **HEAVY AND PROLONGED BLEEDING**.

DEFINITION OF NORMAL MENSTRUATION, MENSTRUAL CYCLE AND ABNORMAL UTERINE BLEEDING[4]

Normal menstruation and the normal menstrual cycle should be defined according to following parameters.

- Regularity of mensus
- Frequency of mensus
- Heaviness of menstrual flow(volume)
- Duration of menstrual flow

Suggested "NORMAL" range for Menstrual Parameters in Mid Reproductive Years.[5]

Menstrual Parameters	Terminology	Normal and abnormal limits
Frequency	Frequent	<24 days
	Normal	24 -38 days
	Infrequent	>38 days
Regularity	Absent/Amenorrhoea	No Bleeding
	Regular	Variation< 20days
	Irregular	variation > 20days
Duration	Prolonged	>8 days
	Normal	4.5 -8days
	Shortened	< 4.5 days
Volume	Heavy	>80 ml
	Normal	5-80 ml
	Light	<5ml

CAUSES OF AUB IN ADOLSCENT AGE GROUP:[5]

- An ovulation,
- Blood dyscrasia (coagulopathy, leukaemia, thrombo cytopenic purpura),
- Thyroid dysfunction,
- Infection (genital TB, PID) &
- Pregnancy related complication.

CAUSES OF AUB IN REPRODUCTIVE AGE GROUP:

- Pregnancy related complication,
- Hormonal and contraceptive usage,
- Uterine fibroid,
- Polyp
- Thyroid dysfunction,
- Anovulation and
- Infection.

CAUSES OF AUB IN PERIMENOPAUSAL AGE GROUP:

- An ovulation,
- Polyp,
- Uterine myoma,
- Endometrial hyperplasia,
- Cervical/endometrial cancer.

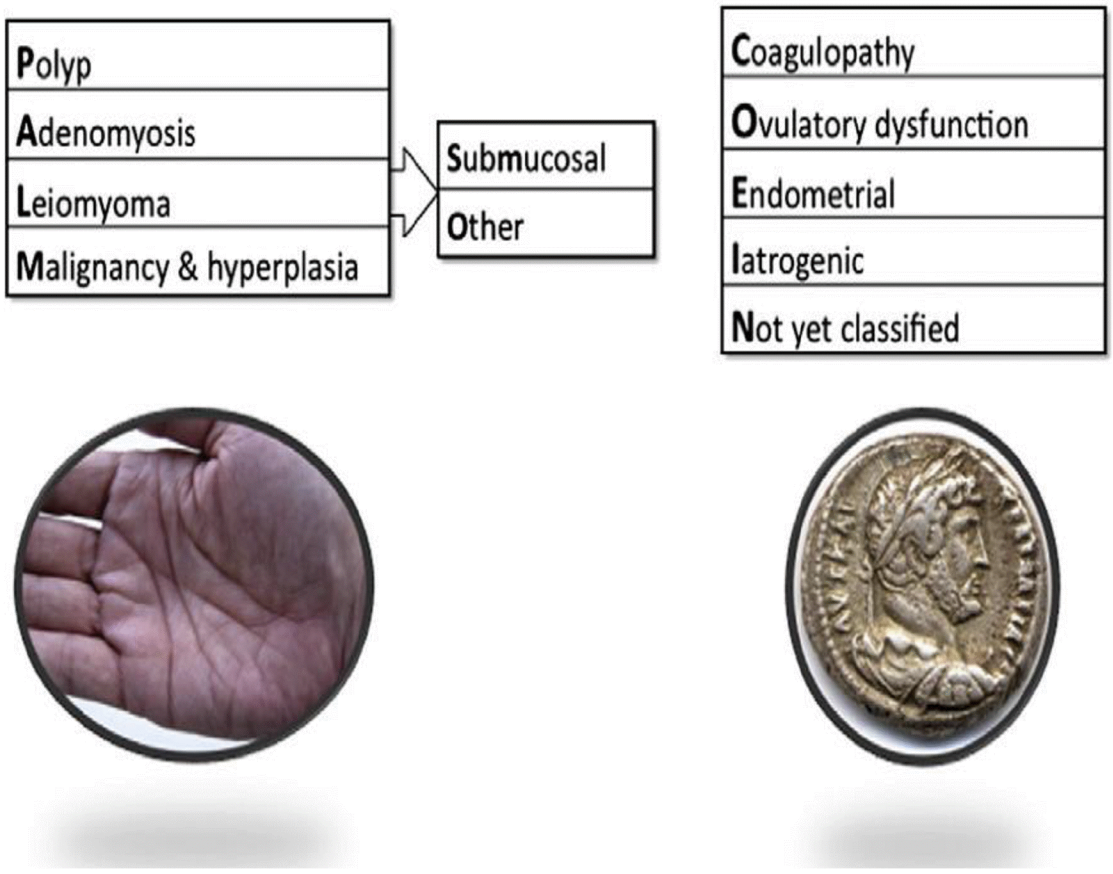
CAUSES OF AUB IN POST MENOPAUSAL AGE GROUP:[6]

- Atrophic endometritis/vaginitis
- endometrial cancer,
- HRT,
- endometrial/cervical polyp,
- endometrial hyperplasia,
- miscellaneous (cervical cancer, uterine sarcoma, urethral caruncle, trauma)
- rectal bleeding
- bleeding from vulva

FIGO classification system for causes of AUB[7]

There are nine main categories which are arranged according to the acronym PALM-COEIN (Polyp, Adenomyosis, Leiomyoma, Malignancy and Hyperplasia, Coagulopathy, Ovulatory dysfunction, endometrial, iatrogenic and not yet classified.

In general the components of the PALM group are discrete (structural) entities that can be measured visually with imaging technique and/or histopathology, where as the COEIN group is related to the entities that are not defined by imaging or histopathology(non- structural)



POLYPUS- (AUB – P): Endometrial /cervical polyp constitute 2-12% of post menopausal bleeding. It is categorized and defined by ultrasound, saline sonography, hysteroscopy with or without histopathology.

P category is subdivided according to number, size, location and histology.

ADENOMYOSIS(AUB –A): It is diagnosed by ultrasound and MRI.MRI is expensive and not available in many centres. In such case ultrasound is used for diagnostic purpose.

This category is subdivided depending on depth of endometrial myometrial invasion. In many cases adenomyosis asymptomatic and only diagnosed on hysterectomy specimens.

LEIOMYOMA (AUB-L):

It include 40-60% of AUB in perimenopausal age group. Many of them are co-incidental findings and are not the cause of the AUB. They are grouped into primary, secondary and tertiary based on number, size and location.

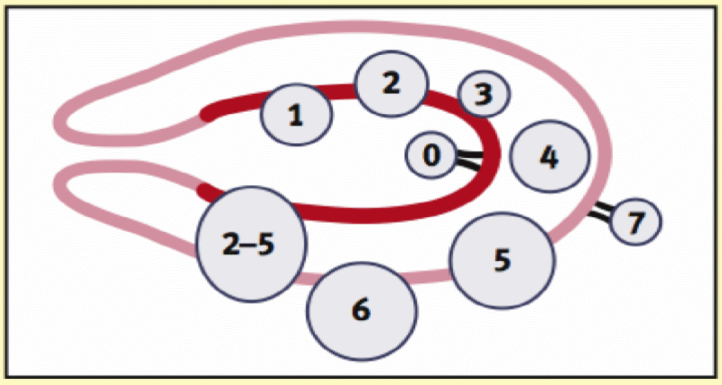
The primary classification reflects only the presence or absence of leiomyoma as determined by ultrasound.

The secondary classification distinguish myoma in the uterine cavity, that causes AUB & one away from the endometrium unlikely to cause AUB.

The tertiary classification involves submucosal growths. It also includes number, size and location of myomas.

THREE STAGE CLASSIFICATION SYSTEM FOR LEIOMYOMA

Primary	Secondary	Tertiary
Absent	Submucous	0 Pedunculated intracavity
		1 ≤50% intramural
OR	OR	2 >50% intramural
Present	Other	3 Intramural but contacts endometrium
		4 Intramural
		5 Subserous ≥50% intramural
		6 Subserous <50% intramural
		7 Subserous pedunculated
		8 Other (eg cervical parasitic)



MALIGNANCY AND PRE MALIGNANT LESIONS (AUB –M):

This is rare in reproductive age group but may occur in a women with polycystic ovarian disease and chronic anovulation. The diagnosis is by histological examination (D/C, Biopsy) or by hysteroscopic biopsy.

[8] Endometrial Hyperplasia is a premalignant lesion, which may be simple or complex. Simple hyperplasia is characterized by dilated or cystic glands with round to slightly irregular shape with an increased glandular to stromal ratio without glandular crowding no cytologic atypia.

Complex hyperplasia has budding, infolding and crowded glands with less intervening stroma without atypia.

Atypical hyperplasia refers to cytological atypia and can be categorized as simple or complex, depending on the corresponding glandular architecture. This include large nuclei of variable size and shape with lost of polarity, increased nuclear to cytoplasmic ratios, prominent nucleoli and irregularly clumped chromatin with parachromatin clearing.

KURMAN CLASSIFICATION OF ENDOMETRIAL HYPERPLASIA

TYPE OF HYPERPLASIA	PROGRESSION TO CANCER (%)
Simple (without atypia)	1
Complex (without atypia)	3
Simple (with atypia)	8
Complex (with atypia)	29

COAGULOPATHY(AUB- C):

It consists of spectrum of systemic disorders of hemostasis that can cause AUB in 14-20% of women of reproductive age. The most common cause is von Willebrand's disease and is mostly asymptomatic.

OVULATORY DISORDERS (AUB-O):

75-80% are anovulatory cycles, 20-25% are ovulatory may be a consequence of luteal-out-of phase (LOOP) with progesterone deficiency. Some of them due to hypothyroidism, hyperprolactinaemia.

ENDOMETRIAL CAUSES (AUB-E):

Due to alteration in mechanism regulating local endometrial hemostasis. Rarely due to tubercular endometritis, chlaymidal infection. This category is by exclusion of other causes.

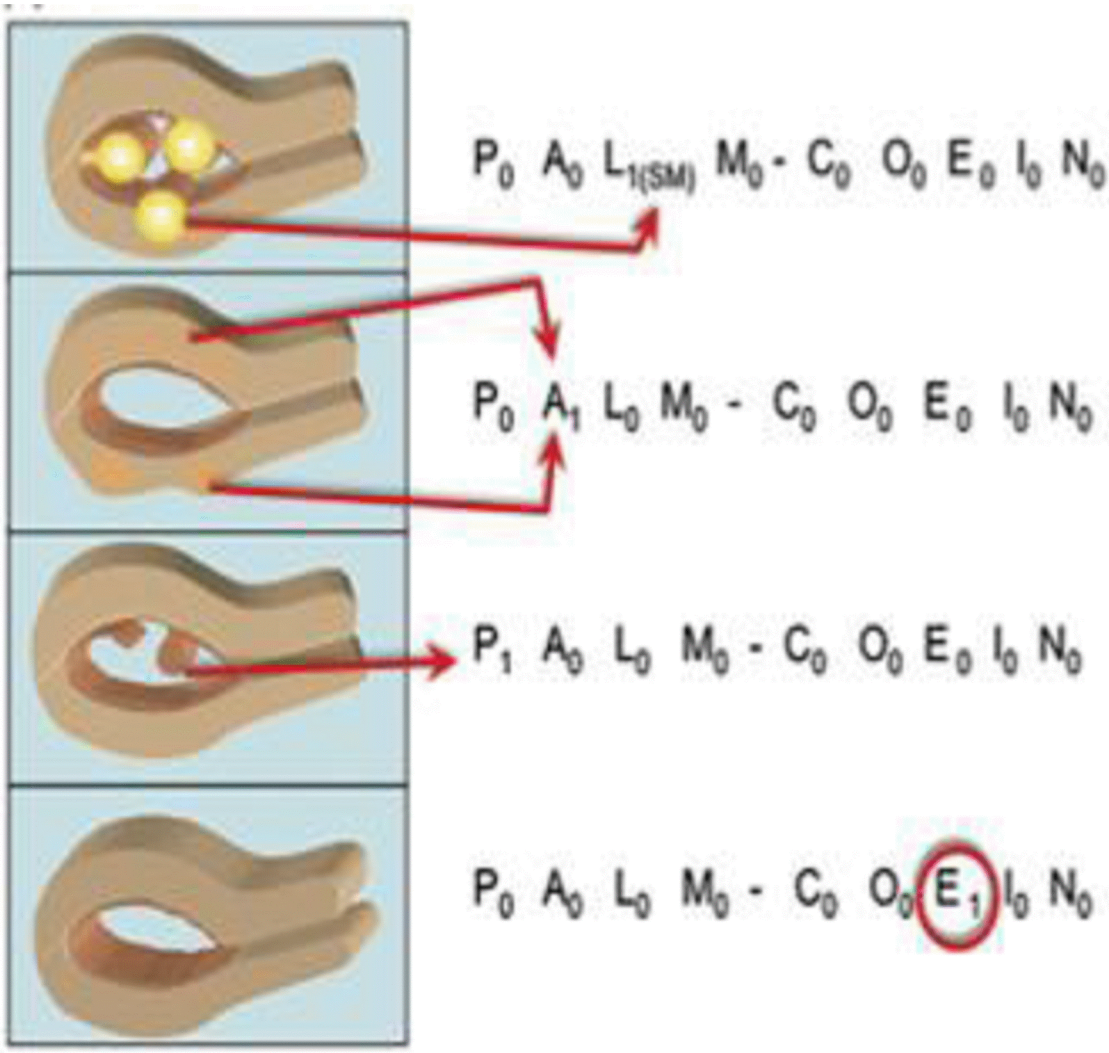
IATROGENIC(AUB –I):

This is due contraceptives(steroids),IUCD,CU-T. The drugs responsible are anticoagulants, phenothiazine and tricyclic antidepressants.

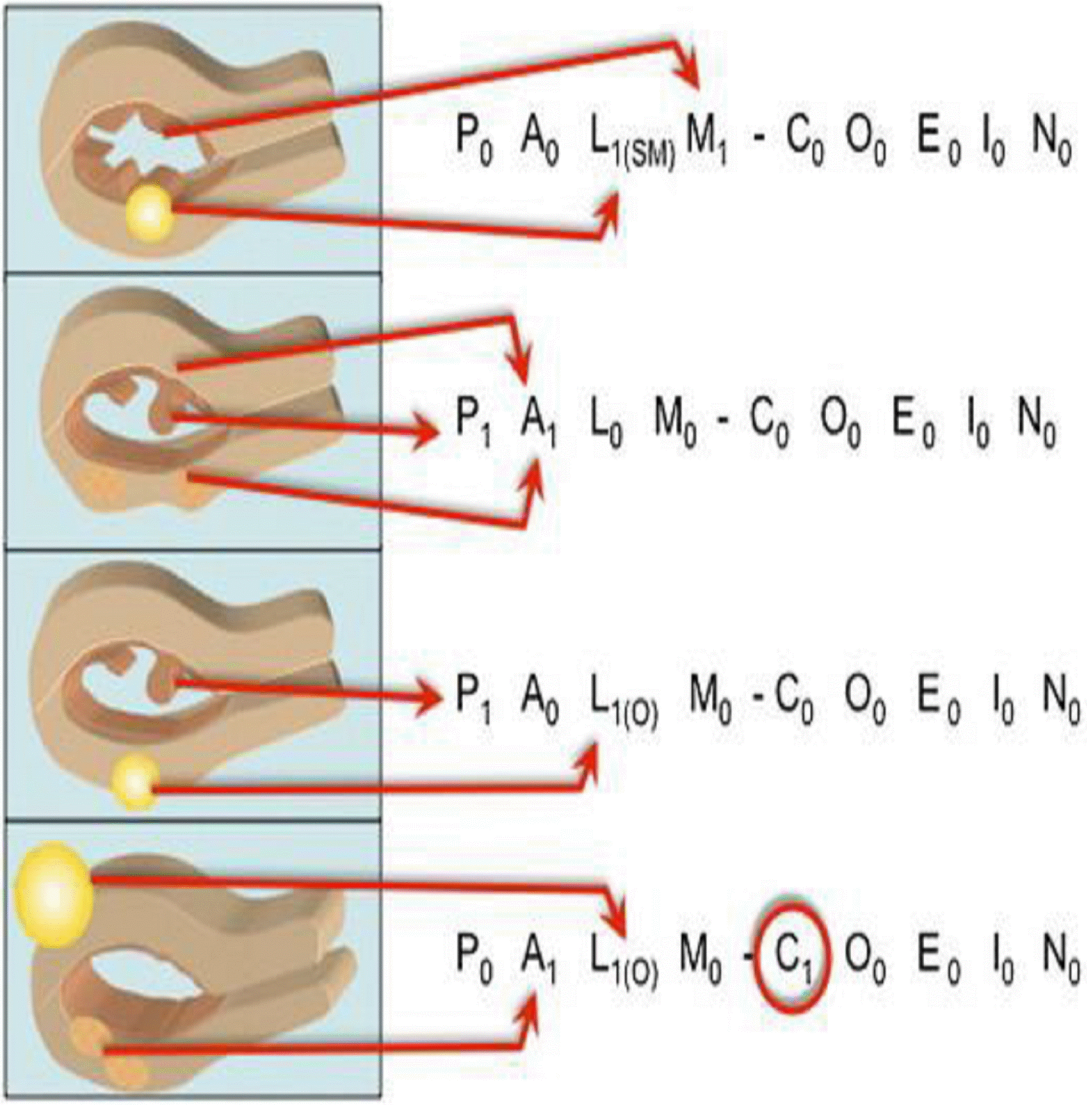
NOT CLASSIFIED(AUB-N):

Rare causes include arteriovenous malformations, varicose veins of uterine vessels. No cause is discernable by existing investigations. These unclassified AUB, when better investigation available, they may be allocated to new category.

NOTATION FOR CASES WITH ONE IDENTIFED ABNORMALITY



NOTATION WITH MORE THAN ONE POSITIVE CATEGORY



CLASSIFICATION OF AUB[2]

AUB may be classified as

- Acute
- Intermittent
- Chronic

DIAGNOSIS OF AUB

For diagnosis of AUB patient should be thoroughly evaluvated. One should make sure that bleeding arising from uterus the number and thickness of sanitary pads are required to measure the menstrual loss.

The passage of clots, significant in size and number indicates loss is so heavy as to defeat the normal fibrinolysis activity of uterus.

After 40years,even though functional disorders are common, possibility of growth benign & malignant should be excluded.

After menopause, local organic cause is often present & even none is present, possibility should not be dismissed.

CLINICAL EXAMINATION:[5]

It includes history of onset, duration, frequency and amount of bleeding.

History hormone replacement therapy/anticoagulants.

Any history of deep vein thrombosis.

History of bleeding tendencies.

Post coital bleeding, dysmenorrhea

General examination.

Breast, Thyroid, spine.

Other systems.

Per Abdominal examination.

Local examination.

Speculum examination

Per vaginal examination.

per rectal examination.

HEMATOLOGICAL INVESTIGATION:

Haemoglobin

Platelet count

Complete hemogram

Bleeding time, clotting time

Full coagulation profile

Random blood sugar

Renal function test

Liver function test

Thyroid function test

Sr.prolaction, LH, FSH.

HIV, VDRL , HBSAg

OTHERS:

Urine pregnancy test

Pap smear (diagnosis about 40-50% of endometrial cancer)

ECG

ECHO

Chest X Ray

IMAGING TECHNIQUE

TRANS VAGINAL SONOGRAPHY:[9]

The first report of transvaginal sonography (TVS) is attributed to Kratochwil in 1969. Development of TVS was delayed until mid 1980s when it was used to evaluate infertility problems.

TVS provide a valuable information in gynaecological disorder in the evaluation of uterus, adnexal mass, inflammatory processes and neoplasm.

It also plays an important role in screening of ovarian and uterine cancer.

It is also useful in non gynaecological condition like urinary incontinence and non gynaecological pelvic mass.

TVS EXAMINATION

EQUIPMENT

TRANSDUCER:

All transducer are either mechanically or electronically focused sector probes. Transducer probes available at different frequencies such as 5,6.5,7,7.5

MECHANICAL TRANSDUCER:

- Consist of one or more crystals that or oscillate in an oil medium
- Less expensive
- Wide field of view
- Near field resolution poor.

ELECTRONICALLY FOCUSSED TRANSDUCER:

- Consist of either an array of crystals sequentially triggered to produce an ultra sound beam or set of crystals shaped to produce the sector image.
- Expensive
- Near field resolution is good.
- Reliable

- Fixed or multiple focal zone

COMPONENTS OF TRANSDUCER:

- Handle –part held by operator
- Shaft –portion that enters vagina
- Tip ,head or foot print –ultra sound crystals

Transducer may vary in shape, size, frequency and sector angles.

Probe handles have different length and shapes. Angulated probes provide better visualisation without causing patient discomfort.

Scan angles vary from 90 – 120 degree. Angulated tips can be rotated up to 180 degree to visualise structures.

PATIENT PREPARATION:

- TVS usually completed with in 10 mins.Women should be briefly explained about the procedure and reason for doing it.
- Patient asked to empty the bladder
- Patient should be afforded privacy.
- Patient in supine position with thighs abducted and knees flexed.
- Pillow can be kept under buttock for better visualisation.

PROBE PREPARATION:

- Probe should be covered with condom containing small amount of gel.
- Plastic sheath or finger of a glove can also be used.
- Spermicidal gels should not be used.
- Additional gel placed outside the condom
- Labia separated by gloved finger and the probe inserted towards rectum and pubococcygeous

After removal of vaginal probe it can be wiped off and can be immersed in disinfecting solution like cidex for about 15 mins.

EXAMINATION TECHNIQUE:

There are 3 basic maneuvers in TVS

- Advancement and withdrawal of probe.
- Angling transducer probe from side to side & anterior to posterior.
- Rotating the transducer along the axis.

APPROACH TO PELVIC STRUCTURES:

- Uterus, fundal portion
- Both ovaries / adnexa & lateral wall of pelvis
- Evaluation of cul de sac.

IMAGING PLANES:

Longitudinal plane- This is the plane in which transducer beam is parallel to long axis of the patient.

Transverse plane- This plane is perpendicular to longitudinal axis.

IMAGE DISPLAY:

- In TVS apex of ultrasound is oriented to up, down, right, left.
- Anterior aspect at the top.
- Posterior aspect at the bottom.

USES OF TRANS VAGINAL SONOGRAPHY:

UTERUS:

- AUB and postmenopausal bleeding for measuring endometrial thickness
- Anteversion and retroversion
- Anomalies

- Fibroid vs adnexal mass
- Endometrial fluid and neoplasms
- Location of intra uterine contraceptive devices.

CERVIX:

- Cervical cysts
- Masses
- Cervical incompetence
- Placental localization

OVARY AND ADNEXA:

- Follicular monitoring
- Oocyte harvesting for IVF
- Adnexal mass
- Screening for ovarian cancer
- Fallopian tube anomalies

FREE FLUID:

- To detect and characterize

INTRA UTERINE PREGNANCY:

- Gestational sac and its content
- Trophoblastic disease.

INTERVENTIONAL PROCEDURE:

- Infertility
- Chorionic villi sampling
- Abscess drainage
- Biopsy of adnexal mass
- Aspiration of fluid

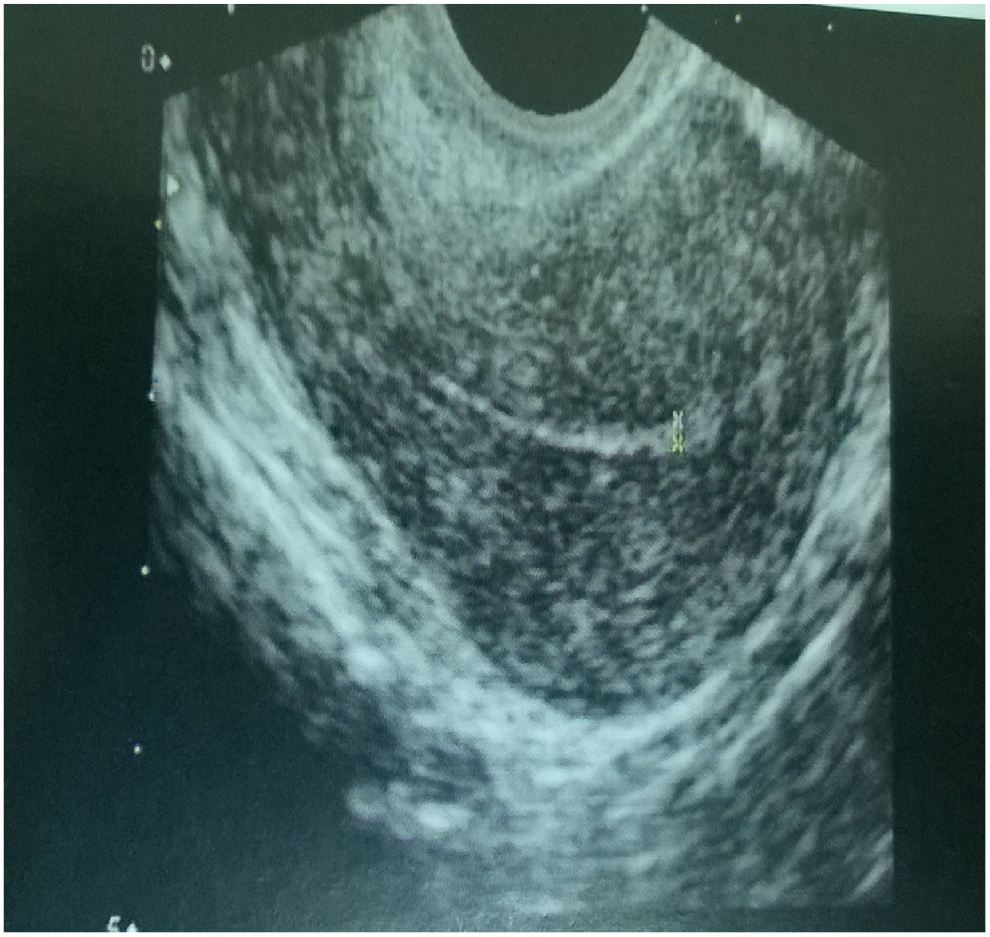
USED ALONG WITH DOPPLER

- Ectopic pregnancy
- Neoplasm
- Ovarian torsion

NON GYNECOLOGICAL PATHOLOGY:

- Incontinence
- Bladder and bowel lesions

ENDOMETRIAL THICKNESS



ENDOMETRIAL THICKNESS IN TVS9

Phase in menstrual cycle	**Range in mm**
Proliferative phase	4- 8
Secretory phase	7-14
Post menopausal phase(no HRT)	<5
Post menopausal phase (HRT)	6-10

ADVANTAGES OF TVS:

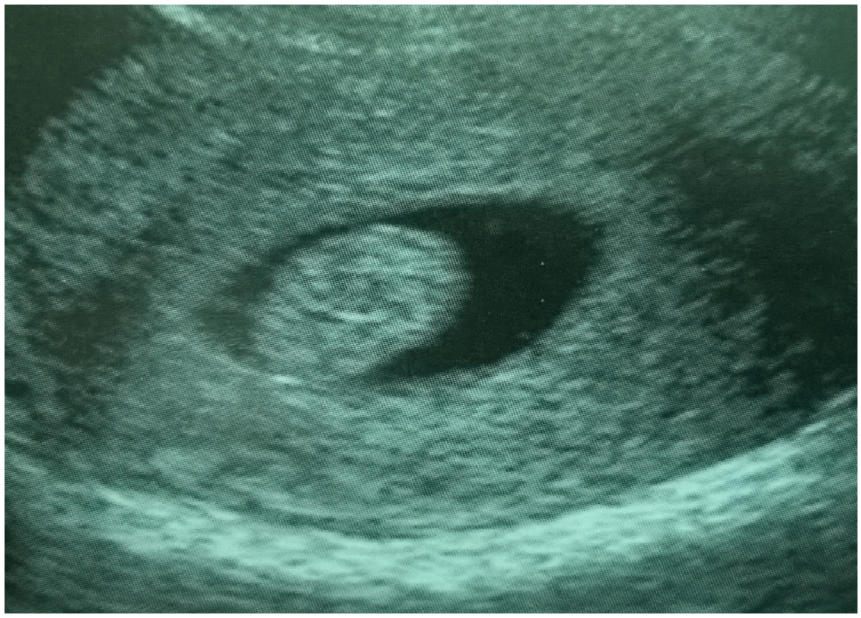
- Optimal visualisation of pelvic structures using high frequency probe.
- Used in obese patient, where visualisation by abdominal scan is poor.

LIMITATIONS:

- Lesion outside the short range of intravaginal probe may be missed. So it should be combined with transabdominal ultrasound.

SALINE INFUSION SONOHYSTEROGRAPHY

Sonohysterography is the instillation of saline into uterine cavity by Foley catheter. TVS is done while instilling saline. This clearly defines small submucous fibroid from endometrial polyp, which might be missed on routine scan.



MRI:

- Very accurate
- Intra uterine lesions are easily identified.
- Myometrial invasions of endometrial cancer can be diagnosed.
- Expensive
- Not routinely used.

OTHERS

Angiography, venography, colour Doppler is indicated only when there is a history of deep vein thrombosis.

SAMPLING TECHNIQUE

Endometrial sampling can be obtained by

- Endometrial aspiration
- Hysteroscopy and guided biopsy
- Dilatation and curettage.

ENDOMETRIAL ASPIRATION:

Endometrial biopsy can be easily performed as an out patient procedure by using pippelle's cannula.

This procedure is performed without anaesthesia.

It does not need any cervical dilatation.

HYSTEROSCOPY:[10]

Hysteroscopy is direct visualisation of cervical canal and uterine cavity, by means of rigid, flexible or contact hysteroscope.

The procedures by hysteroscope were first described by **Panteleoni** in 1869. But there was a developmental delay until 1970.

Hysteroscopy increasingly become method of choice for intrauterine pathology complications also in increased rate.

INSTRUMENTS:

TELESCOPE:

4mm telescope gives clear image.

3mm telescope office hysteroscopies are available which can be used for minor operative procedure.

Telescope – zero & 30 degree available.

30 degree has advantage of oblique view.

Telescope has three parts

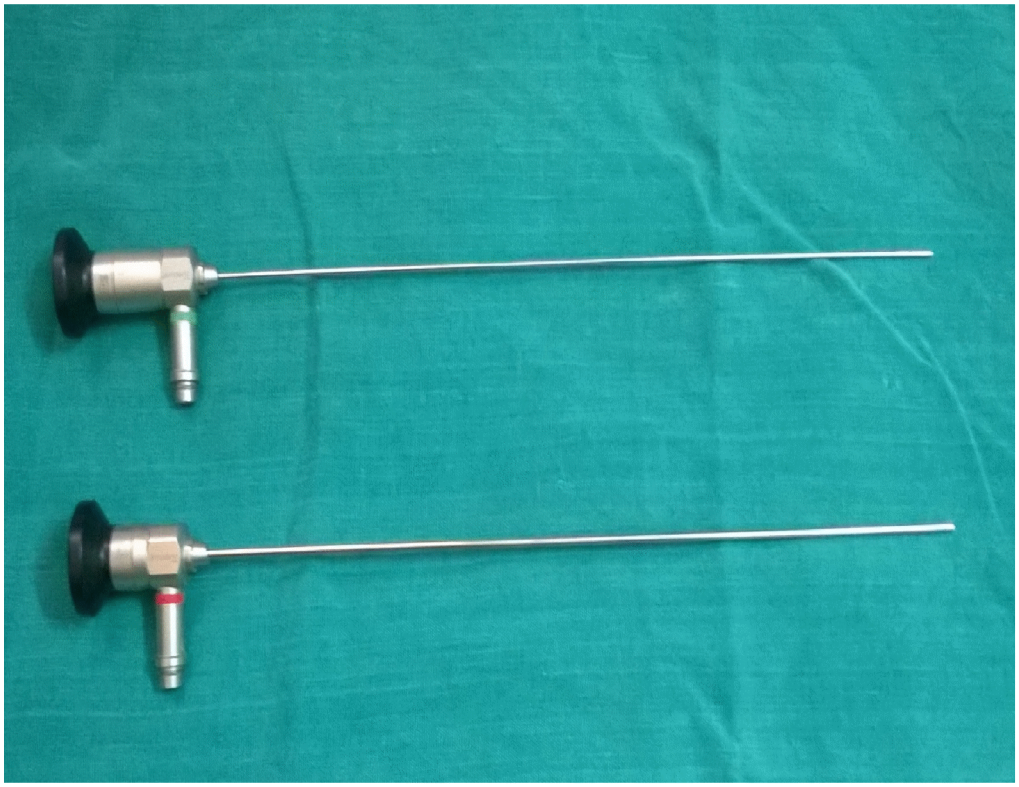
1. Eye piece
2. Barrel
3. Objective lens

LIGHT GENERATORS:

There are three types

- Tungsten(orange yellow light)
- Metal halide
- Xenon (white light)

TELESCOPE



DIAGNOSTIC SHEATH AND OPERATIVE SHEATH:

Diagnostic sheath is to deliver the distending media into uterine cavity. It is about 4-5 mm in diameter. It can be instilled into cervical cannal without dilation.

Operative sheath is largest about 7-10 mm. It allows the space for instillation of 3-4mm telescope sealed with rubber nipple tom prevent leakage of distending media.

Recently introduced isolated channel sheath consist of double flushing sheath that permits simultaneous instillation of inner sheath and media return by perforated outer sheath. It allows the constant flow of medium in and out of cavity and gives a clear image.

ACCESSORY INSTRUMENTS:

- Alligator grasping forceps
- Biopsy forceps
- Scissors
- Monopolar & bipolar electrodes.

DISTENDING MEDIA

- Gas
- Liquid
  1. High viscous
  2. Low viscous

GAS:

Co2 is used as distending medium. It should never exceed 100ml/min. pressure should be maintained < 150mmHg.

Trendelenburg position should be avoided. Contraindicated in cardiovascular pathology.

LIQUID – HIGH VISCOSITY:

Hyskon (32% dextran, 70 in dextrose)

- It can be used for both diagnostic and operative media.
- Mean pressure is 76mmHg.
- Immiscibility with blood and permits visualisation even in active bleeding.
- Can become harder and clog forms.

- When > 500ml is infused causes pulmonary edema.
- Anaphylactoid reactions can occur
- Fibroplastic action, alteration in platelet adhesiveness.
- Interference with Von Willebrand's factor

LOW VISCOSITY MEDIA:

- Normal saline
- Ringer lactate
- Glycine 1.5%
- Sorbital 3%
- Mannitol 5%

Normal saline is a good conductor of electricity, mono-& bipolar electrodes cannot be used.

Vascular absorption of glycine & sorbitol can Acute hyponatremia & cerebral edema.

Hysteroscopies are used for both Diagnostic and therapeutic approaches.

DIAGNOSTIC HYSTEROSCOPY:

To evaluate uterine cavity to identify structural anomalies like polyp, septum, fibroid and directed biopsies to identify the causes of AUB.

Small polyp can be removed simultaneously.

INDICATION:

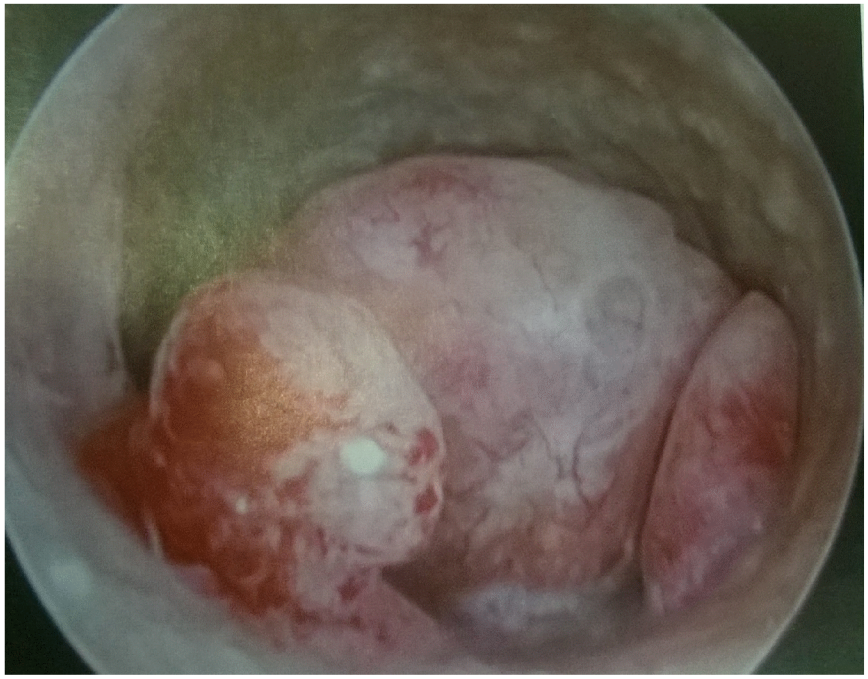
1. Mainly for hysteroscopic guided biopsy in the evaluation of AUB in peri- and post menopausal women.

2. Evaluation of infertility

- For detecting uterine anomalies
- Asherman's syndrome, synechiae
- Submucous fibroid and polyps
- Tubal cannulation in cornual block (debris,mucus plug)

3. Missed IUCDS

HYSTEROSCOPIC VIEW OF ENDOMETIAL POLYP



CONTRAINDICATIONS:

- Pregnancy
- Infection
- Bleeding pv
- Cervical cancer
- Cervical stenosis
- Cardio pulmonary problems

FLEXIBLE HYSTEROSCOPY:

Flexible fibre optic hysteroscopes is ideal for diagnostic office hysteroscopy for AUB. 4.8mm diameter hysteroscope are available.

It can also be used for trans cervical tubo cornual recanalization and also for retrieval of missed IUCD's.

OPERATIVE HYTEROSCOPY:

Procedures done using hysteroscopies are

- Polypectomy
- Myomectomy
- Septal resection
- Adhesiolysis in Asherman's syndrome
- Endometrial ablation (TRCE)
- Sterilisation
- Tubal cannulation

COMPLICATIONS:

- Haemorrhage
- Perforation

- Anaesthetic complication
- Co2 embolism
- Diathermy usage
- Fluid and electrolyte disturbances
- Cerebral oedema.

ADVANTAGES:

- Least invasive
- Shortened hospital stay
- Rapid recovery

DILATATION AND CURETTAGE:

This is performed by initial cervical dilatation followed by curettage of the endometrial cavity.

It can be done under TIVA, paracervical block.

COMPLICATIONS:

- Perforation
- Bleeding

- Trauma to internal organs through perforation
- Injury to cervix
- Infection
- Intra uterine synechiae

MATERIALS AND METHOD

This prospective study is conducted at Government Theni medical college Hospital Theni , on 100 patients attending gynaecology op , who were randomly chosen between July 2013 – August 2015 in the perimenopausal and post menopausal age group 40 years and above with abnormal uterine bleeding patients were admitted with complaints of heavy menstrual bleed, inter menstrual bleed, heavy prolonged bleeding, continuous bleeding, post menopausal bleeding and irregular bleeding.

INCLUSION CRITERIA:

Abnormal uterine bleeding with

- Women in age group >40 years.
- Women with Postmenopausal bleeding.
- Uterine size < 12 weeks size.

EXCLUSION CRITERIA:

- Pregnancy
- Unmarried women
- Pelvic inflammatory disease
- Morbid medical illness

- Women < 40 years
- Profuse bleeding PV
- Uterine size > 12 weeks size.

Complete history taking was done. Last menstrual period were noted.

Any history of drug allergy, bleeding disorders, morbid medical illness like uncontrolled diabetes, hypertension ,severe anaemia, DVT were ruled out.

Clinical examination including general examinations, vitals monitoring, other system examination.

Complete blood investigation, urine investigation, chest X ray, ECG, ECHO were taken.

Patients were sent for anaesthetic fitness.

PATIENT PREPARATION:

Patient advised to be nil per oral since night 8 Pm.

Informed consent about the procedure.

Local & bowel preparation.

Pre anaesthetic medications given.

Trans vaginal ultra sonography done.

TRANS VAGINAL ULTRA SONOGRAPHY:

Transvaginal ultrasonography done with 2 D, 6.5 MHz probe. Patient is asked to empty the bladder. Patient in supine position with knees flexed and thighs abducted. Vaginal probe is covered with condom containing small amount of gel. Gel is also applied outside the condom. After gentle separation of labia trans vaginal ultrasonography done.

- Endometrial Thickness
- Uterine size.
- Adnexal pathology
- Those findings missed in clinical examination were noted.

Then patient is subjected to hysteroscopy.

- In the theatre patient were reassessed for cardio vascular and respiratory system.
- Vitals were monitored.
- Under short GA, Total Intravenous Anaesthesia, hysteroscopy done.
- Duration of procedure is about 10-15 mins.
- Hysteroscopy done in post menstrual phase.

- Patient in lithotomy position parts painted and draped.
- Bladder catheterised. Bimanual pelvic examination done.
- Sims speculum then introduced, anterior lip of cervix caught with valsellum.
- Cervix is dilated up to size 8 MD dilator.
- Diagnostic hysteroscopy is introduced, which consist of inflow and outflow channel.
- Distending media - Normal Saline.

Following findings were noted:

- Cervical canal
- Internal os
- Endometrial surface
- Vascularity
- Bilateral tubal ostia.

Uterine cavity is also visualised for abnormal findings like

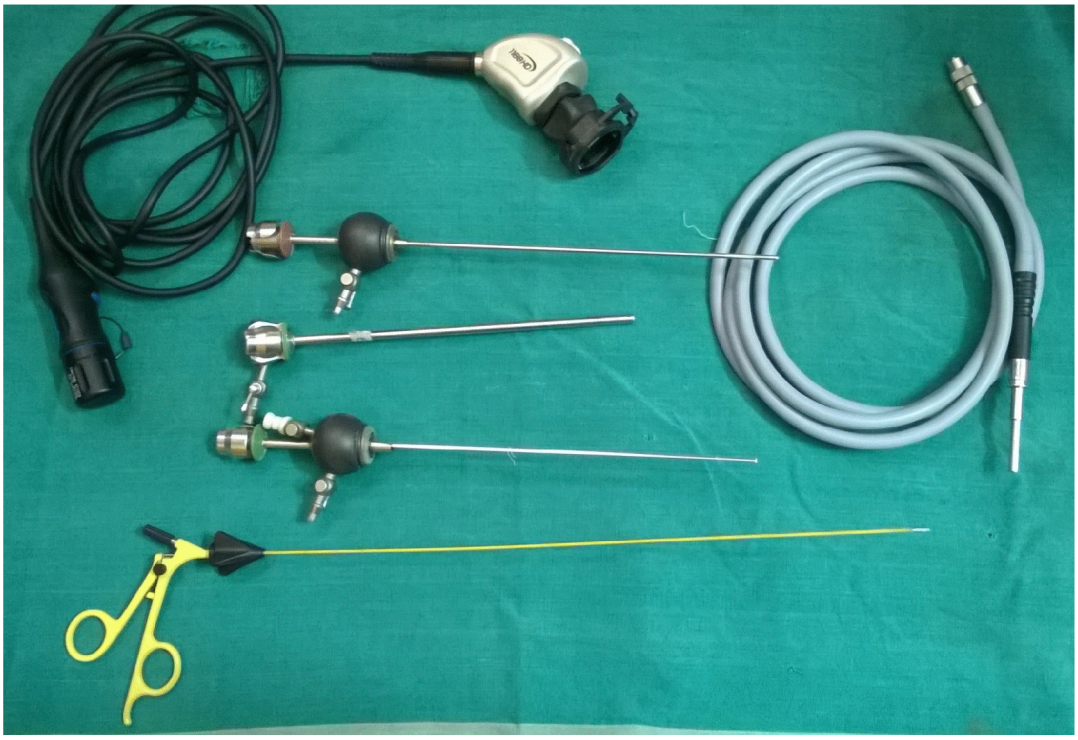
- Polyp
- Sub mucous fibroid

- Endometrial hyperplasia
- Atrophy
- Synechiae
- Vascular abnormalities like AV malformations
- Cancer

HYSTEROSCOPIC GUIDED BIOPSY:

Under same anaesthesia, endometrial specimen were taken and sent for histopathological examination.

HYSTEROSCOPIC INSTRUMENTS




TOSHIBA
STORZ

OBSERVATION AND RESULTS

For a period of one year average number of cases attending in gynaecological op - 11,202

Percentage of Abnormal Uterine Bleeding in GTMCH

Total number of cases with abnormal uterine bleeding (	4452	39.74%
Total number of cases with AUB > 40 years	2986	67%
Total number of cases with perimenopausal age group	2172	73%
Total number of cases with postmeopausal bleeding	814	27%

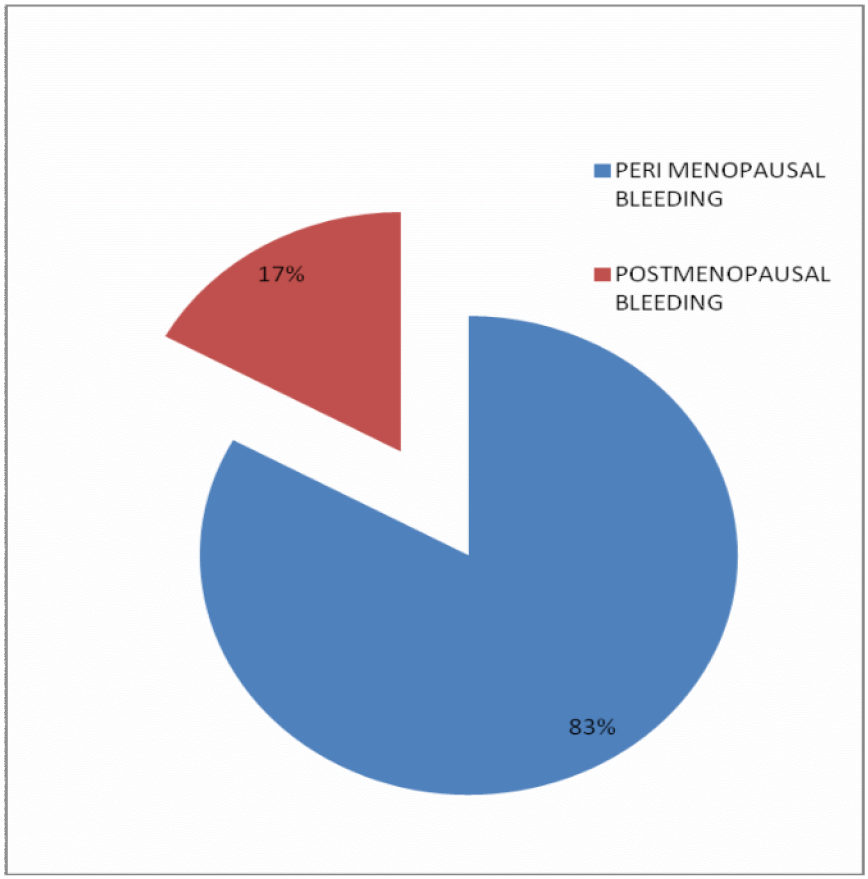
Average total number of cases with abnormal uterine bleeding is 4452 which constitute about 39%

Out of which AUB above 40 years is 2986 which constitute 65%

Out of which perimenopausal group is 2172, constitute 73%

Postmenopausal group is 814, constitute 27%

AUB IN PERIMENOPAUSAL AND POST MENOPAUAL AGE



NUMBER OF AUB CASES IN RELATION TO AGE

Total number of cases 100

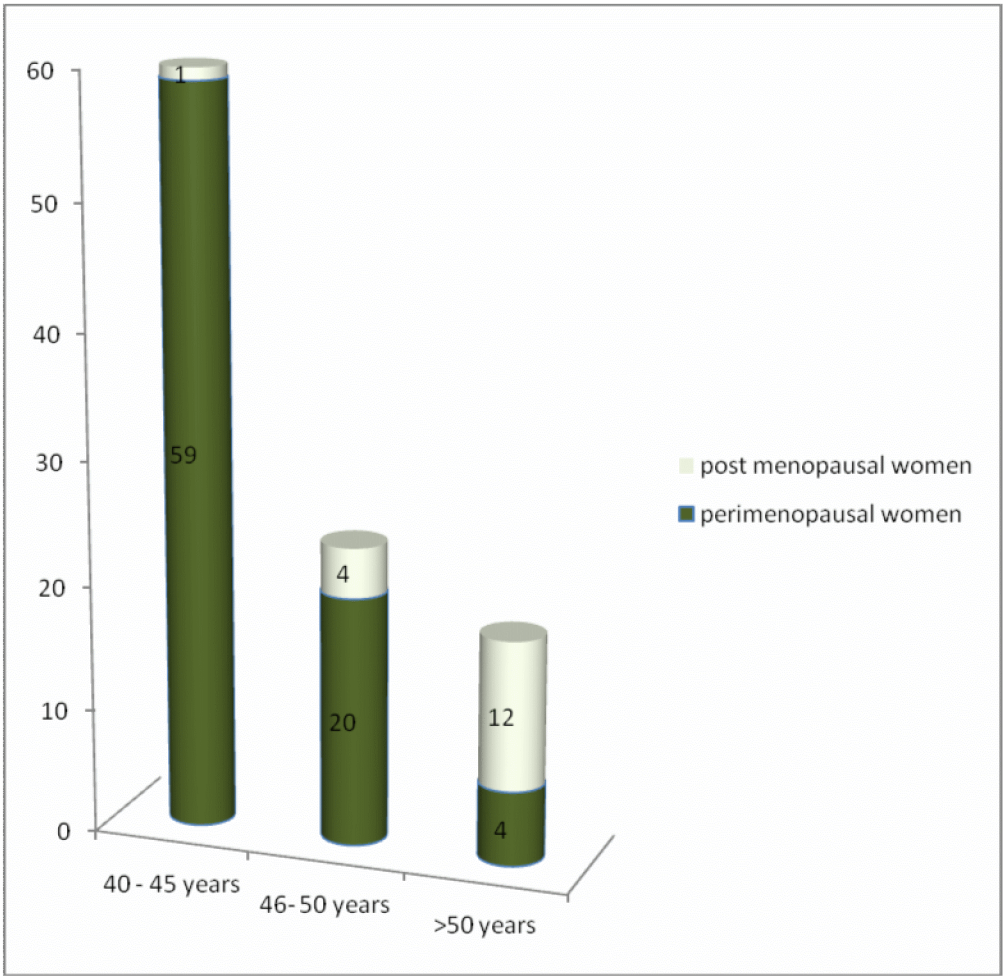
AGE	NUMBER OF CASES	PERCENTAGE
40-45 years	60	60 %
46 – 50 years	24	24%
>50 years	16	16%
Total	100	100%

Out of 100 cases 60% were in age group of 40- 45 years

24% were in age group of 46-50 years

16% were in the age group above 50 years

AGE


60
50
40
30
20
10
0
1
59
4
20
12
4
40 - 45 years
46- 50 years
>50 years
post menopausal women
perimenopausal women

AUB IN RELATION TO PARITY

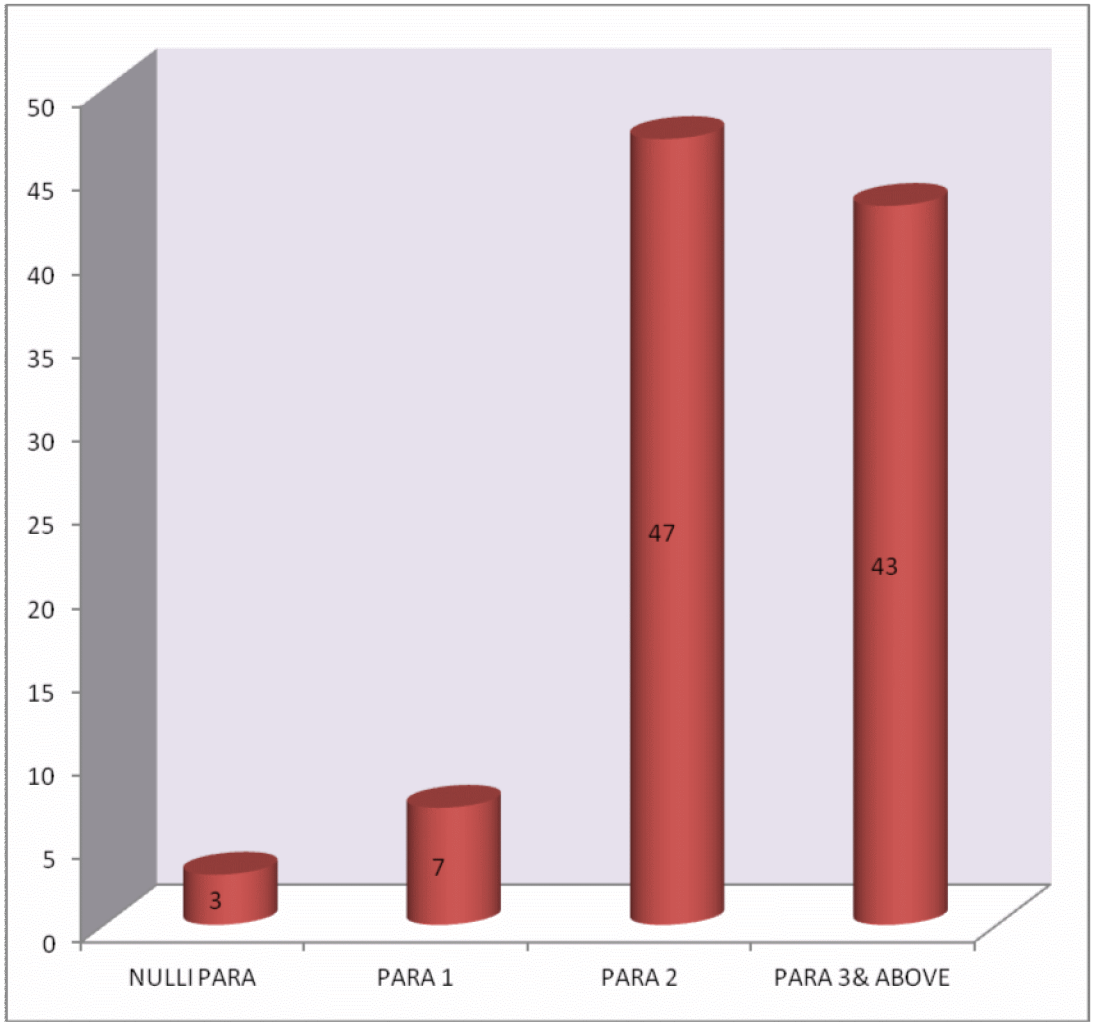
PARITY	NUMBER OF CASES	PERCENTAGE
Nullipara	3	3%
Para 1	7	7%
Para 2	47	47%
Para 3 & above	43	43%
Total	100	100%

Most of the patient with AUB belong to para 2, para 3 & above

Out of 47 cases in para 2, 4% were postmenopausal women

Out of 43 cases in para 3 & above 13 %were postmenopausal women.

AUB IN RELATION TO PARITY

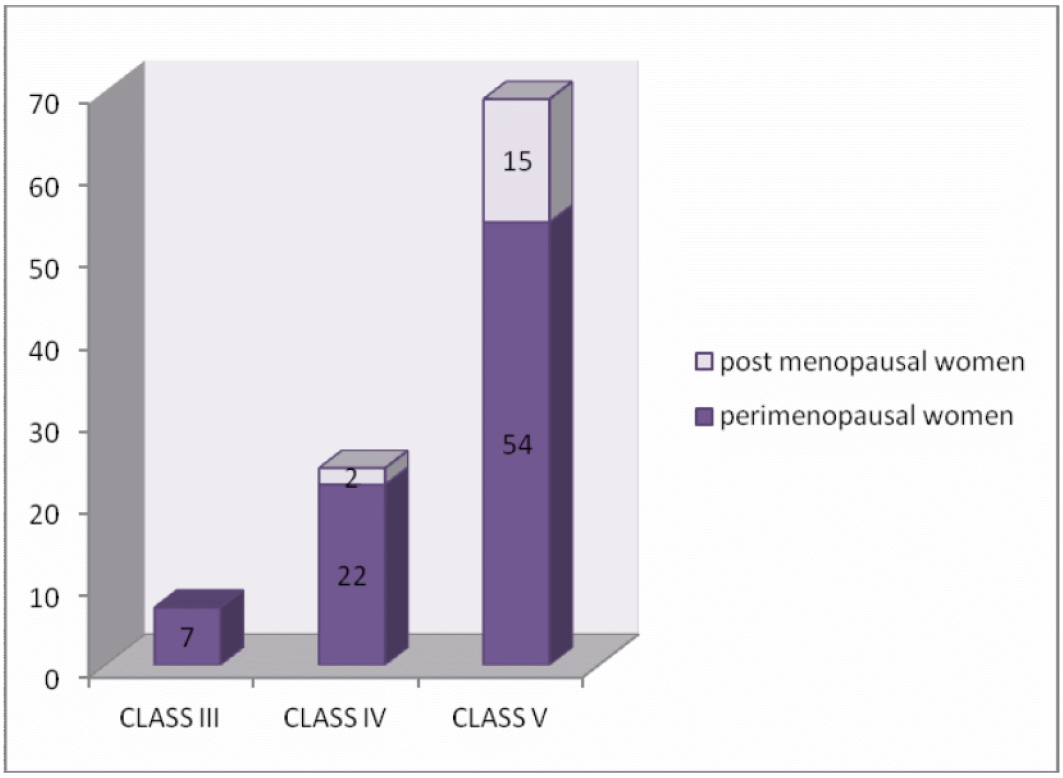


AUB IN RELATION TO SOCIO ECONOMIC CONDITION

SOCIO ECONOMIC CONDITION	NO OF CASES	PERCENTAGE
Class III	7	7%
Class IV	24	24%
Class V	69	69%
Total	100	100%

Most of the patient 69% belongs to low socio economic status of class v.

AUB IN RELATION TO SOCIO ECONOMIC CONDITION



DURATION OF AUB

DURATION OF AUB	NO OF CASES	PERCENTAGE
< 6 months	44	44%
6months – 1year	33	33%
>1year	23	23%
Total	100	100%

Most of the cases of AUB 44 % presented within 6months.

33% of cases between 6months – 1year.

23% of cases above 1year.

94% of post menopausal women presented within 6 months.

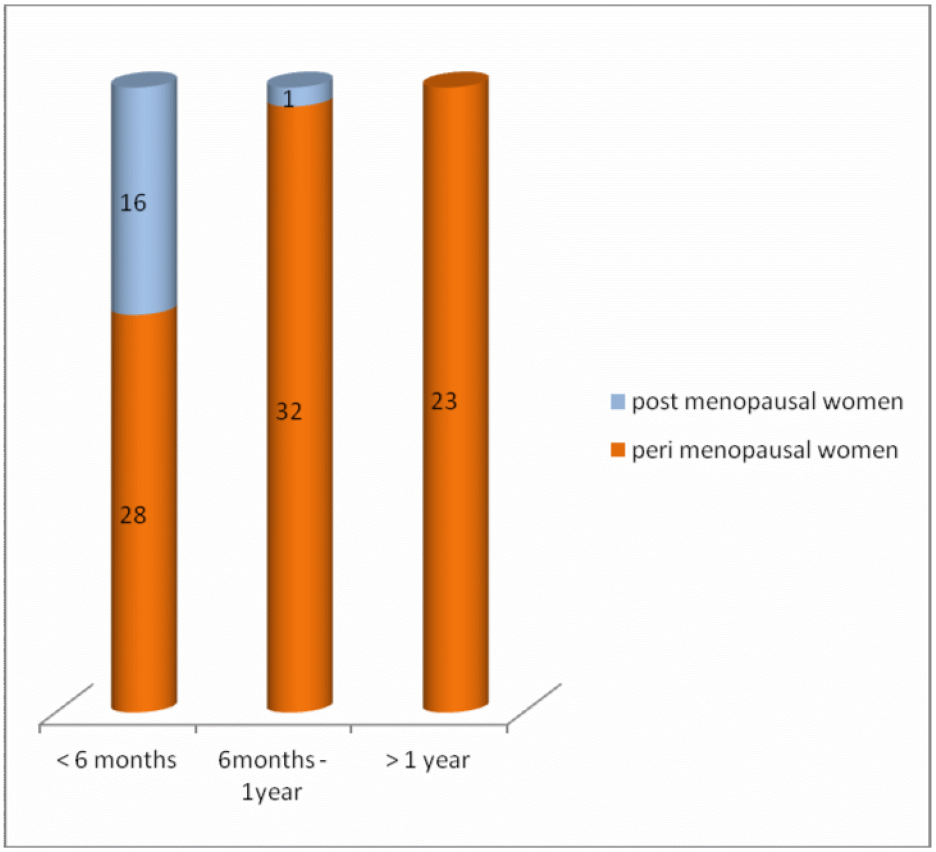
6% of post menopausal women presented within 6 months – 1 year.

34% of perimenopausal women presented to hospital within 6months.

38% of perimenopausal women presented between 6months – 1year.

28% of perimenopausal women presented more than the period of 1 year.

AUB IN RELATION TO DURATION



Most of the cases of post menopausal bleeding 94% presented within 6months.

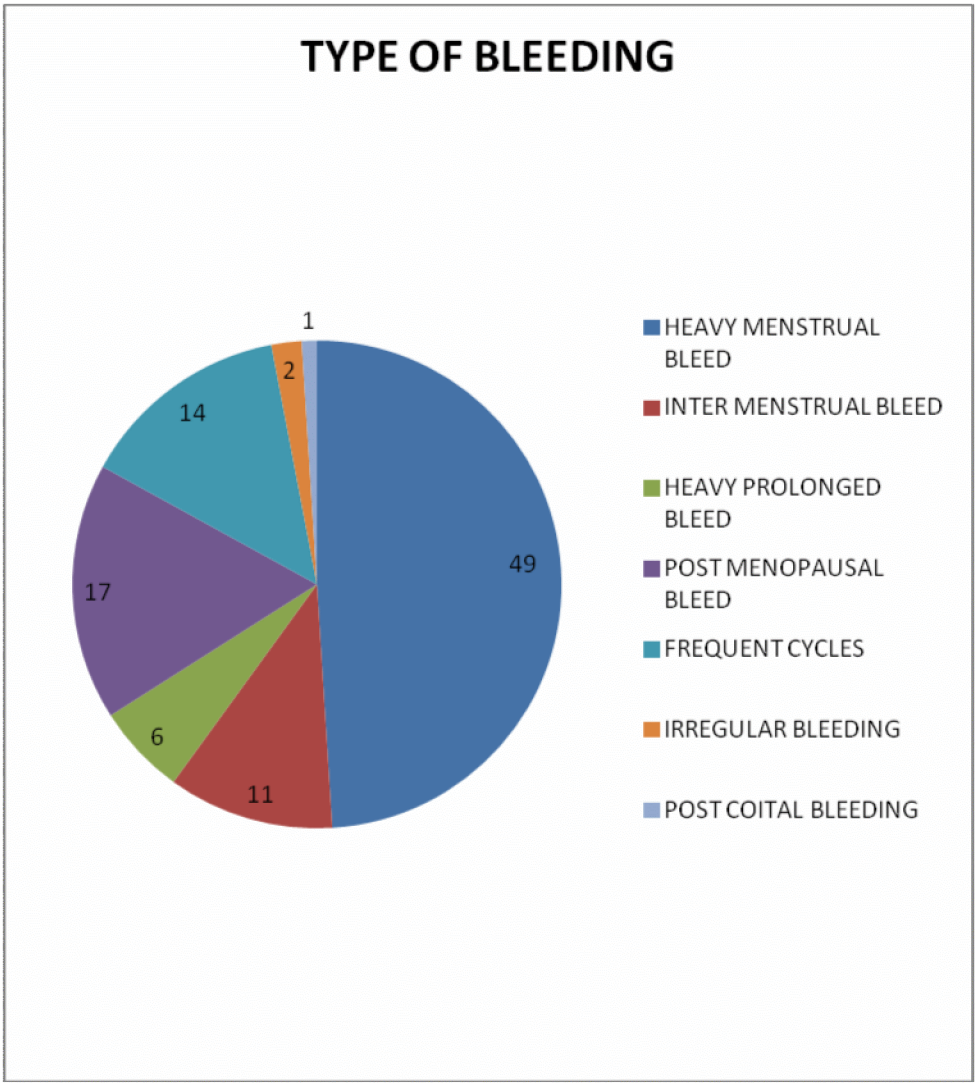
6% postmenopausal cases presented within 6months – 1year.

AUB IN RELATION TO TYPE OF BLEEDING

TYPE OF BLEEDING	NO OF CASES	PERCENTAGE
Heavy menstrual bleeding	49	49%
Inter menstrual bleeding	11	11%
Heavy prolonged menstrual bleeding	6	6%
Post menopausal bleeding	17	17%
Frequent cycles (< 21 days)	14	14%
Irregular bleeding	2	2%
Post coital bleeding	1	1%
total	100	100%

Most common type of bleeding is heavy menstrual bleed, which is 49% followed by postmenopausal bleed, 17%.

AUB IN RELATION TO TYPE OF BLEEDING



AUB ASSOCIATED WITH MEDICAL CONDITION

MEDICAL CONDITION	NUMBER OF CASES	PERCENTAGE
Anaemia	27	27%
hypothyroid	5	5%
Diabetes	14	14%
Hypertension	11	11%
Diabetes & Hypertension	2	2%

27% of cases of AUB associated with Anaemia.

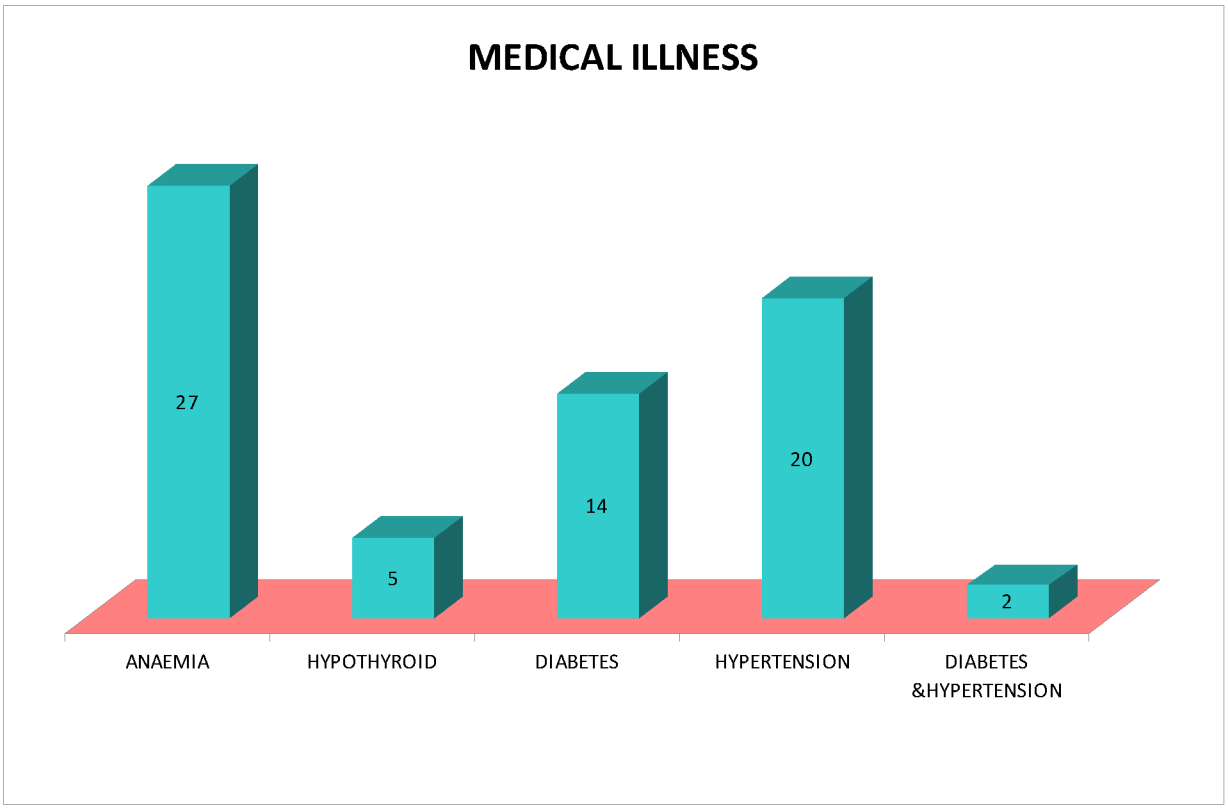
5% of cases associated with Hypothyroid.

14% of cases associated with Diabetes.

11% of cases associated with Hypertension.

2% of cases with both diabetes and hyper tension.

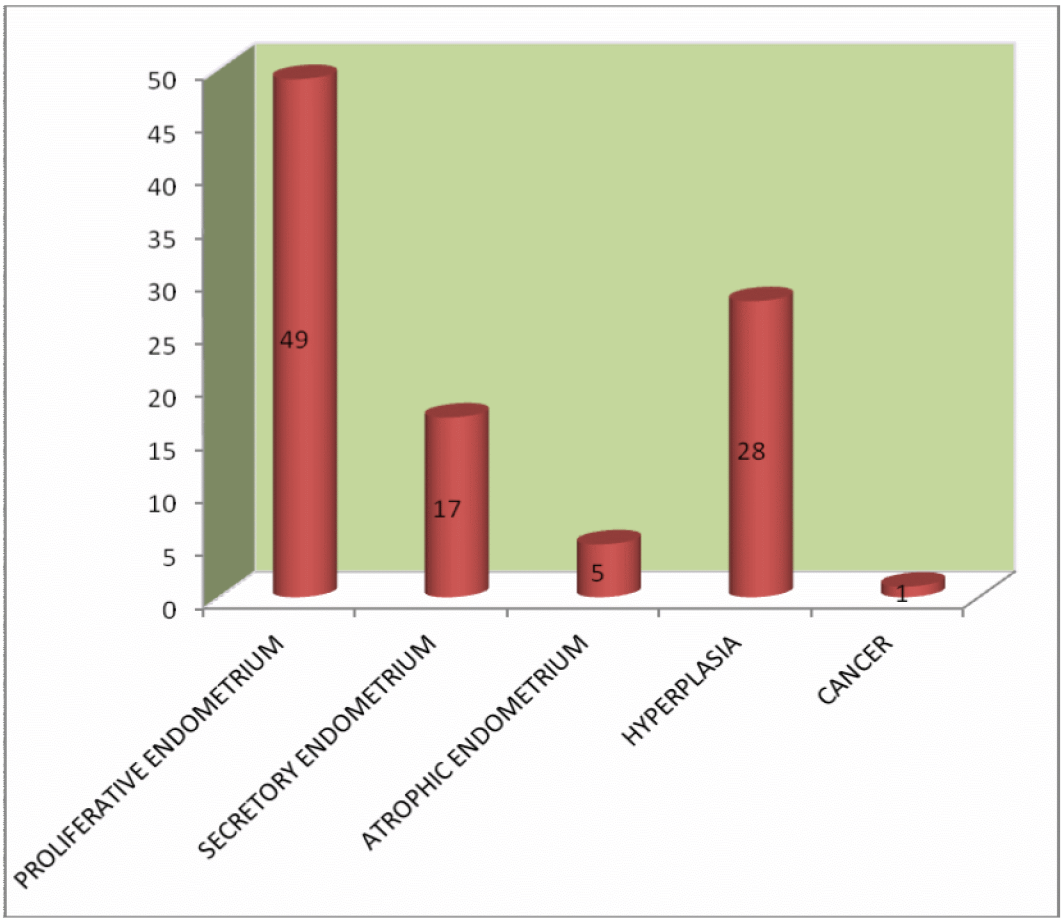
AUB IN RELATION TO MEDICAL ILLNESS



HISTOLOPATHOLOGICAL FINDINGS

TYPE OF ENDOMETRIUM	NO OF CASES	PERCENTAGE
Proliferative	49	49%
Secretory	17	17%
Atrophic	5	5%
Hyperplasia	28 Simple-26 Simple with atypia- 1 Complex -1	28% Simple-26% Simple with atypia- 1% Complex-1%
Cancer	1	1%
Total	100	100%

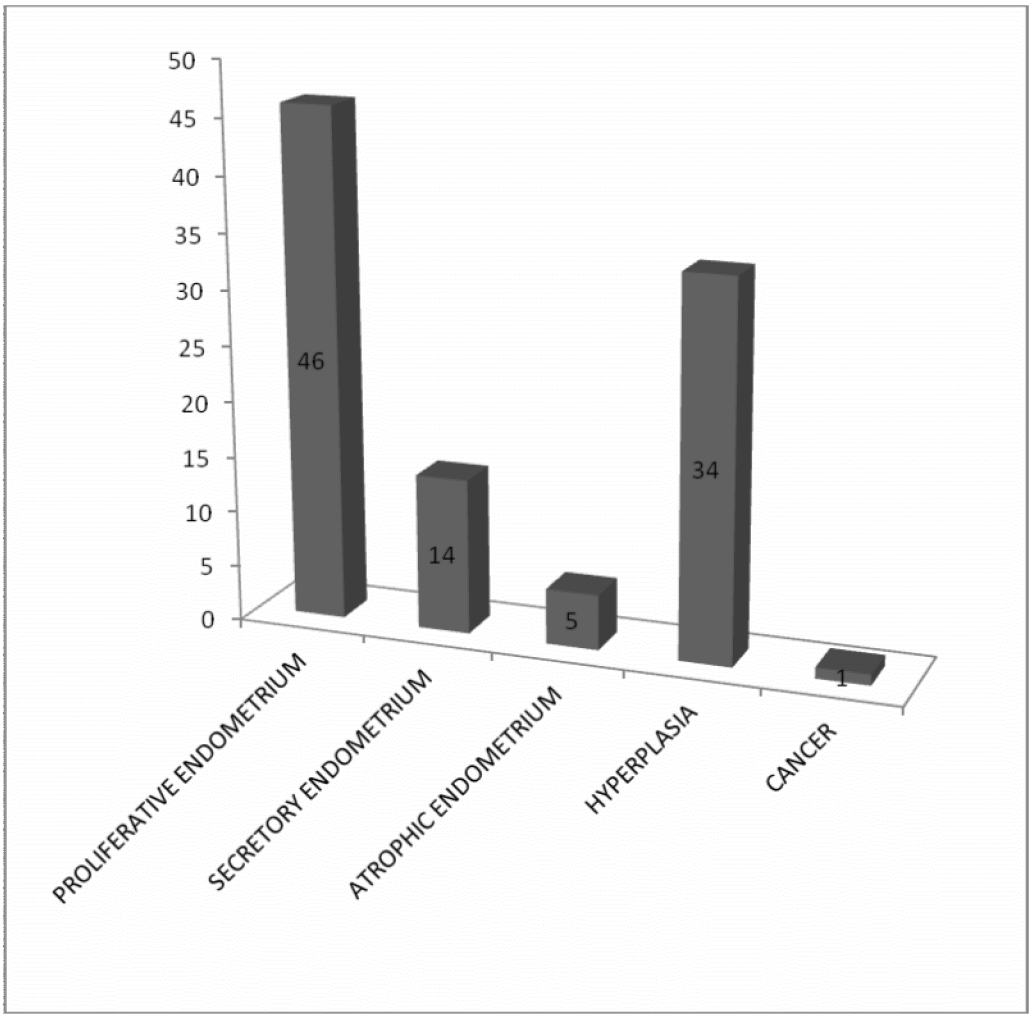
HISTOPATHOLOGICAL FINDINGS



TRANS VAGINAL ULTRASOUND FINDINGS

ENDOMETRIAL THICKNESS	TYPE OF ENDOMETRIUM	NO OF CASES	PERCENTAGE
<5mm	Atrophic Endometrium	5	5%
4-8mm	proliferative	46	46%
8-14mm	secretory	14	14%
>14mm- 20mm	hyperplastic	34	34%
>20mm	cancer	1	1%

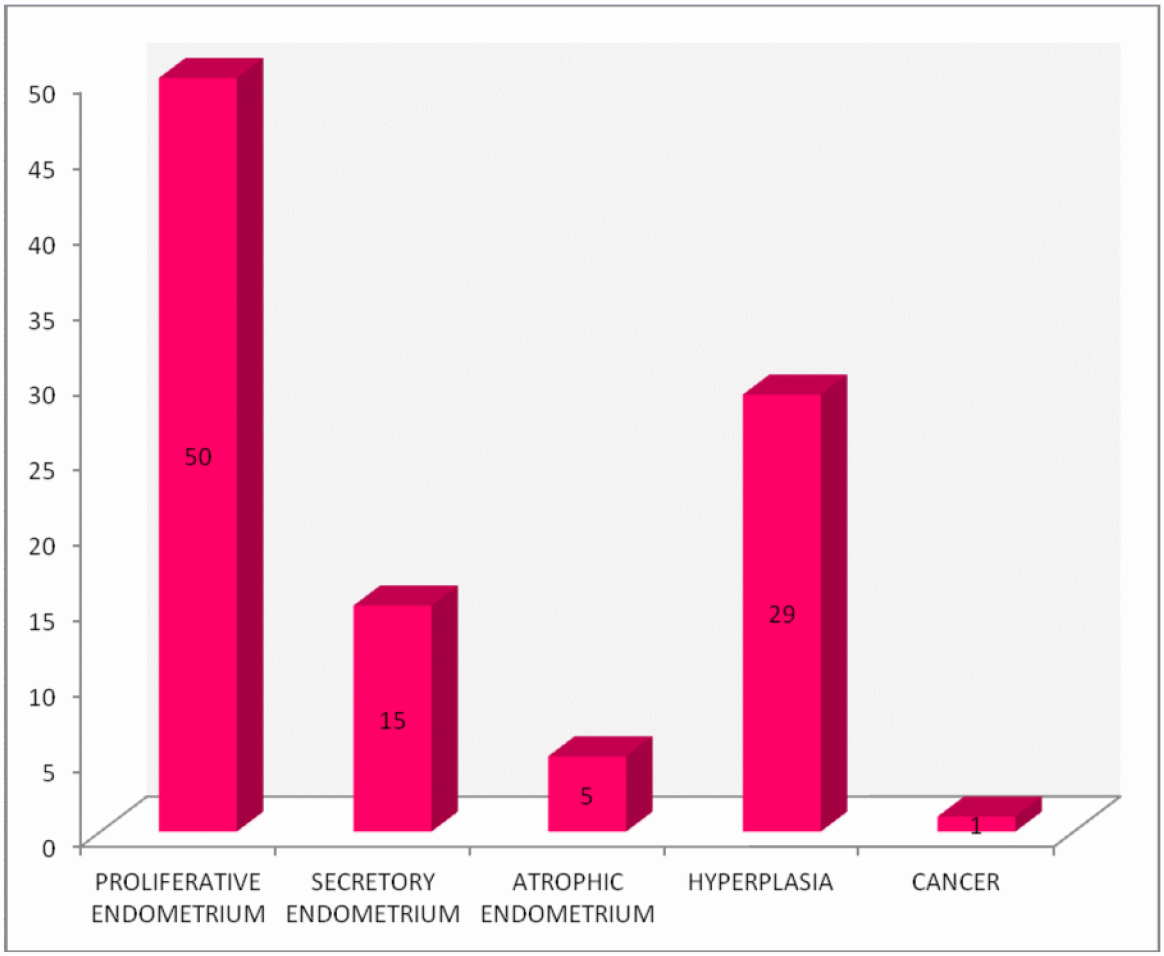
FINDINGS IN TRANS VAGINAL ULTRASOUND



FINDINGS IN HYSTEROSCOPY

TYPE OF ENDOMETRIUM	HYSTEROSCOPY	PERCENTAGE
Proliferative endometrium	50	50%
Secretory endometrium	15	15%
Atrophic endometrium	5	5%
Hyperplasia	29	29%
cancer	1	1%
Total	100	100%

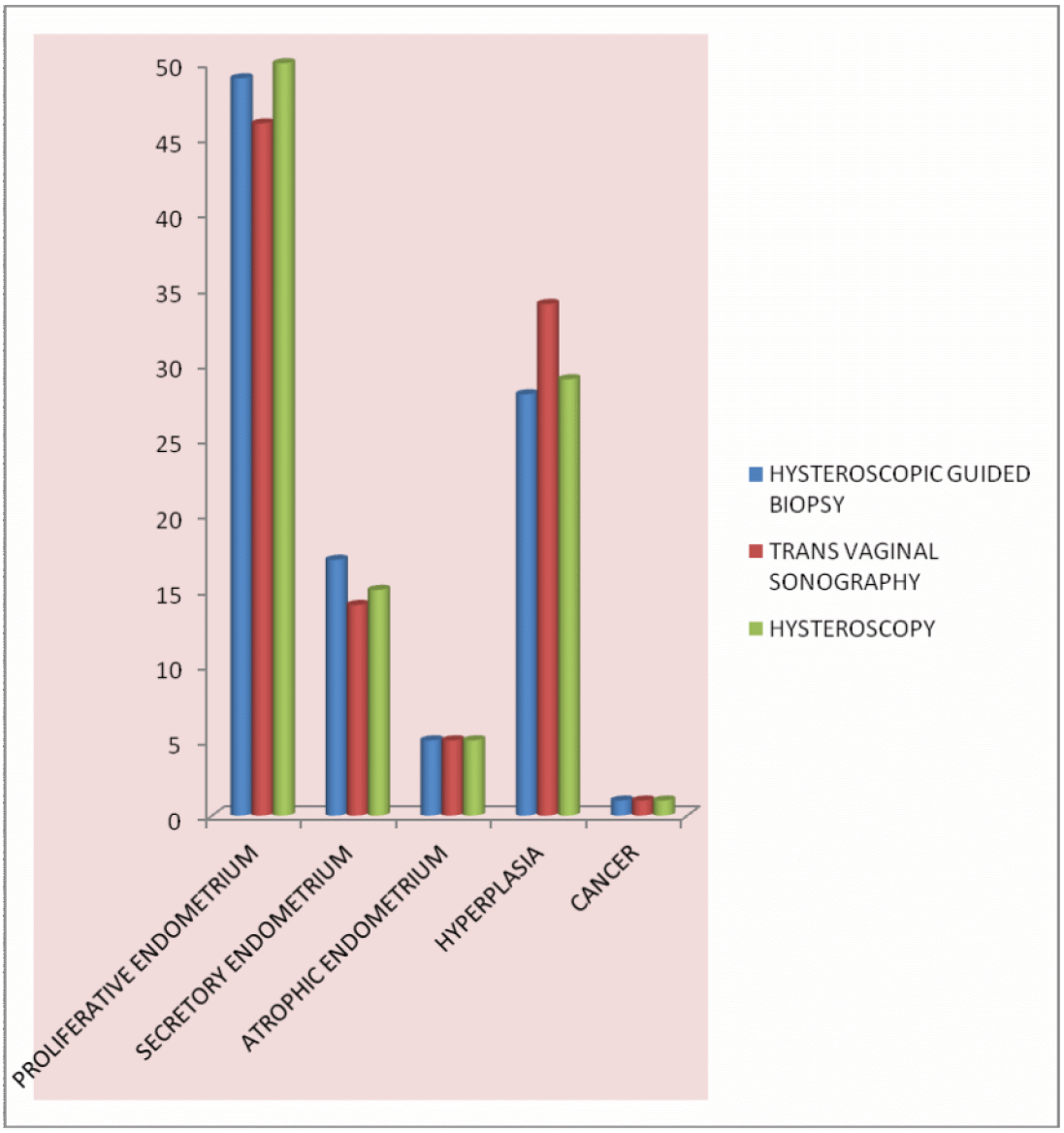
FINDINGS IN HYSTEROSCOPY



COMPARISON OF HYSTEROSCOPY AND TRANS VAGINAL ULTRASONOGRAPHY WITH HYSTEROSCOPIC GUIDED BIOPSY.

TYPE OF ENDOMETRIUM	HYSTEROSCOPIC GUIDED BIOPSY		TRANS VAGINAL ULTRASOUND		HYSTERO SCOPY	
	cases	%	cases	%	cases	%
Proliferative Endometrium	49	49%	46	46%	50	50%
Secretory Endometrium	17	17%	14	14%	15	15%
Atrophic Endometrium	5	5%	5	5%	5	5%
Hyperplasia	28	28%	34	34%	29	29%
Cancer	1	1%	1	1%	1	1%
Total	100	100%	100	100%	100	100%

COMPARISON OF HYSTEROSCOPY AND TRANS VAGINAL ULTRASONOGRAPHY WITH HYSTEROSCOPIC GUIDED BIOPSY



RESULTS

Total number of cases in this study is 100. Here proliferative, secretory & atrophic endometrium are considered normal, whereas hyperplasia including simple hyperplasia, simple hyperplasia with atypia, complex hyperplasia and cancer are considered abnormal.

FINDINGS IN HYSTEROSCOPIC GUIDED BIOPSY:

Out of 100 cases,

Proliferative endometrium found in 49 cases

Secretory Endometrium found 17 cases

Atrophic Endometrium in 5 cases

Hyperplastic Endometrium in 28 cases

Cancer in 1 cases

So total number of normal cases in hysteroscopic guided biopsy is 71

Total number of abnormal cases in hysteroscopic guided biopsy is 29

SENSITIVITY AND SPECIFICITY OF TRANS VAGINAL ULTRASOUND IN DETECTING ABNORMALITY

Total number of abnormal cases identified in TVS is 35

Of the 35 cases , biopsy confirmed to be normal in 26cases

So, true positive (a)- 26

False positive (b)-9

TVS detected normal endometrium in 65 cases

Of which, biopsy confirmed normal endometrium in 62cases

True negative -62 (d)

False negative -3(c)

HYSTEROSCOPIC GUIDED BIOPSY

		ABNORMAL	NORMAL	
TVS	ABNORMAL	26 (a)	9 (b)	35
	NORMAL	3 (c)	62 (d)	65
	TOTAL	29	71	100

SENSITIVITY = TRUE POSITIVE/

TRUE POSITIVE+FALSE NEGATIVE * 100

= a/ a+c * 100

= 26 / 29* 100

Sensitivity =89.6%

SPECIFICITY = TRUE NEGATIVE /

TRUE NEGATIVE + FALSE POSITIVE * 100

= d / b+ d

= 62/ 65* 100

Specificity = 87.3%

POSITIVE PREDICTIVE VALUE = TRUE POSITIVE/

TRUE POSITIVE +FALSE POSITIVE* 100

= a / a+b * 100

= 26/35 * 100

Positive predictive value = 74.28%

NEGATIVE PREDICTIVE VALUE = TRUE NEGATIVE /

TRUE NEGATIVE +FALSE NEGATIVE * 100

= d / c+d * 100

= 62/ 65* 100

Negative predictive value =95.38%

TVS

SENSITIVITY	89.6%
SPECIFICITY	87.3%
POSITIVE PREDICTIVE VALUE	74.28%
NEGATIVE PREDICTIVE VALUE	95.3%

SENSITIVITY AND SPECIFICITY OF HYSTEROSCOPY IN DETECTING ABNORMAL ENDOMETRIUM

Total number of cases with abnormality in hysteroscopy is 30

Of which biopsy confirmed 27 cases

So true positive =(a) = 27

False positive =(b)= 3

Hysteroscopy found normal endometrium in 70 cases

Of which biopsy confirmed 68 cases.

So true negative =(d)=68

False negative =(c)=2

HYSTEROSCOPIC GUIDED BIOPSY

	ABNORMAL	NORMAL	
ABNORMAL	27(a)	3(b)	30
NORMAL	2 (c)	68(d)	70
TOTAL	29	71	100

Sensitivity = a/ a+c * 100 =27/29 * 100 = 93%

Specificity = d / b+ d* 100 = 68/ 71* 100=95.7%

Positive predictive value =a/ a+b *100 = 27/ 30* 100 =90%

Negative predictive value = d/ c+d * 100=68/ 70 * 100=97.14%

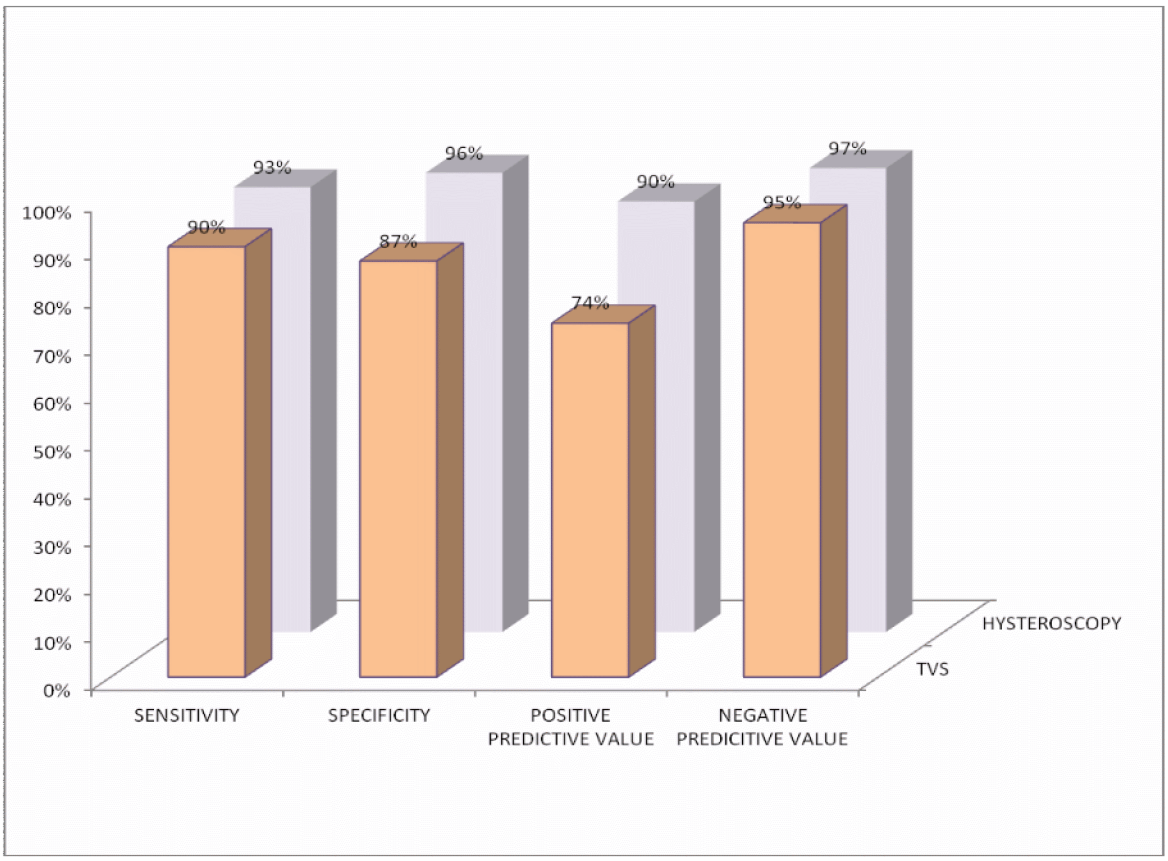
STATISTICAL FINDINGS IN HYSTEROSCOPY

SENSITIVITY	93%
SPECIFICITY	95.7%
POSITIVE PREDICTIVE VALUE	90%
NEGATIVE PREDICTIVE VALUE	97.14%

COMPARISON OF STATISTICAL VALUE BETWEEN HYSTEROSCOPY & TVS

STATISTICS	TVS	HYSTEROSCOPY
SENSITIVITY	89.6%	93%
SPECIFICITY	87.3%	95.7%
POSITIVE PREDICTIVE VALUE	74.28%	90%
NEGATIVE PREDICTIVE VALUE	95.3%	97%

COMPARISON OF STATISTICAL VALUE BETWEEN TVS & HYSTEROSCOPY



Chi square test (Test for significance):

In this study group 100 patients fitting into inclusion criteria were subjected to trans vaginal ultrasound, hysteroscopy and then hysteroscopic guided biopsy were done. TVS identified abnormality in 35 cases. Hysteroscopy identified abnormality in 30 cases.

	ABNORMALITY DETECTED	ABNORMALITY NOT DETECTED	**P value**
HYSTEROSCOPY	30	2	0.07
TRANS VAGINAL ULTRASOUND	35	3	

P value > 0.05, the chi square test shows that there is no significant difference in hysteroscopy and trans vaginal ultra sound in diagnosing AUB.

DISCUSSION

In a study conducted by **Dr.vashiverma et al**[18] in abnormal uterine bleeding in perimenopausal women by trans vaginal ultrasound , hysteroscopy and histological specimen, shows adnexal pathologies and myometrial pathologies were detected in TVS. Hysteroscopy have therapeutic advantage .Both hysteroscopy and TVS are complementary.

In a study conducted by **Machado et al in 2005**, endometrial thickness of < 5mm diagnosed in ultrasound did not done any D&C, and none of the patient had malignancy. Even though upper limit for endometrial thickness cut off in many studies favoured for 8mm.

In a study conducted by **Veena et al, in 2014**[19], "Role of Trans vaginal sonography & Diagnostic hysteroscopy in AUB", both TVS & Hysteroscopy can detect endometrial intracavitary abnormalities with varying accuracy. Transvaginal ultrasound accuracy can be increased by hystero sono salphingography.

Waleed el khayat et al ,2010 study on "Comparative study of TVS & Hysteroscopy for the detection of endometrial pathological endometrial lesion in women with perimenopausal bleeding" includes 50 patient subjected to 2D TVS , hysteroscopy and HPE. Both helps to

differentiating normal from abnormal endometrium. But TVS more sensitive, where as Hysteroscopy is more specific.

Mandakani parihar et al study on AUB in patients between 40-65years shows TVS lacks specificity, but in specificity can be imporved with hysteronsonography. Endometrial cystic changes and adenomyosis can give false positive results.

	TRANS VAGINAL SONOGRAPHY				HYSTEROSCOPY			
Study	SENS	SPEC	PPV	NPV	SENS	SPEC	PPV	NPV
Yela et al 2009	95.6%	7.4%	53.3%	60%	95.7%	83%	82.2%	95.9%
Waleed el khayat et al 2011	92.3%	72.72%	92.3%	72.7%	78.75%	95.83 %	98.43	57.5%
Ryu et al	79%	45.8%	83%	39.3%	95%	83.3%	95%	83.3%
Urvashi verma et al	73.07 %	95.8%	95%	76.6%	89.99%	97.56 %	97.95%	90.56%
In our study	89.6%	87.3%	74.2%	95.3%	93%	95.7%	90%	97%

PPV- POSITIVE PREDICTIVE VALUE SENS –SENSITIVITY

NPV – NEGATIVE PREDICTIVE VALUE SPEC-SPECIFICITY

In a study conducted by Umit Goktolga et al in 2007, " Diagnostic Accuracy of TVS, sonohysterography and office hysteroscopy in the evaluation of AUB", the sensitivity of TVS and SIS were 36.4% & 33.8% & the sensitivity of hysteroscopy is lower(p=0.08). in comparison the specificity ratio of sonohysterography had higher ratio than others.

TVS vs SIS = 0.08 HSC vs SIS = 0.07

Sensitivity of TVS is 46.5% in diagnosing intra uterine pathology, where as for SIS it is 97%.

So SIS is considered as testable method which can replace office hysteroscopy.

Another study conducted on "Use of Diagnostic Hysteroscopy in AUB in perimenopausal age group and its clinicopathological correlation with ultrasound and histopathology findings experience in tertiary care in 2015 . It is a retrospective observational study conducted in between 40 – 45 years of age group between April 2012- JAN 2015 at Mumbai by **RAJASHREE et al** [21].This study shows both endometrial biopsy and ultra sound are poorly sensitive in detecting intra uterine pathology , so for detecting intra uterine pathology , hysteroscopy can be utilised as first line investigation in AUB.

SUMMARY

This study "Comparison of Diagnostic accuracy of Hysteroscopy versus Transvaginal sonography in the evaluation of Abnormal Uterine Bleeding in perimenopausal age group" is conducted at Govt. Theni Medical college , Theni.

100 patients with abnormal uterine bleeding with 40 years and above, who fits in to inclusion criteria were taken. 83 patients were perimenopausal women. 17% were post menopausal women.

Average age of the cases were 45 years, 90% of them were multiparous, 69% belonging to low socio economic status of class V. most of the cases presented with in 6 months duration. 49% of cases presented with heavy menstrual bleeding.

After taking through history taking, clinical examination, blood investigations, pap smear were taken. Patients were subjected to Trans vaginal sonography then to hysteroscopy and guided biopsy taken and sent for histopathology. Findings of all the three are correlated.

In our study TVS, detected 94% proliferative endometrium, 82% of secretory endometrium, 100% of atrophic endometrium were detected. 1 case with endometrial thickness more than 2cm suspected for cancer ,confirmed by hysteroscopy and guided biopsy. It also

diagnoses 5 cases , 62.5% of polyp, whereas hysteroscopy and biopsy identified polyp in 8 cases. 2cases of sub mucus myoma (66.67%) were identified in TVS, whereas hysteroscopy and biopsy identified in 3 cases.

Sensitivity, specificity positive predictive value, negative predictive value for TVS is 90%, 87%, 74%, 93%. & for hysteroscopy shows 93% , 96%,90%, 97% respectively.

TVS also found adenomyosis in 4 cases which were not diagnosed by hysteroscopy and guided biopsy but confirmed in hysterectomy specimen. TVS also identifies intra mural fibroid in 10 cases.

Hysteroscopy is specific for endometrial intracavitary lesions like polyp & sub mucus fibroid.

When TVS shows endometrial thickness of more than 5mm in post menopausal women, additional investigations can be used to identify the pathology.

TVS is a non invasive procedure, cheap, practically available with minimal patient discomfort. It does not require anaesthesia, can be used in patients with morbid medical illness. It is a simple procedure, uterine and endometrial thickness can be accurately measured. Adnexal

pathologies, free fluid & myometrial lesions can be visualised can be used in distorted endometrial cavity and anomalous uterus.

Even though TVS measure of endometrial thickness is a poor diagnostic test. It can differentiate normal and abnormal endometrium and apparently helps in diagnosis.

CONCLUSION

Patient with AUB in perimenopausal and postmenopausal should be first subjected to Trans vaginal Ultrasound, since it a non invasive, cheap, safe, easily available with minimal patients discomfort. It can identifies uterine pathologies like fibroid, adenomyosis and hyperplasia. Adnexal pathologies can also be identified

Hysteroscopies can be reserved for cases with intracavitary endometrial pathology, where it has an advantage of diagnostic and therapeutic value.

Both hysteroscopy and trans vaginal sonography are complementary to each other in the evaluation of AUB in perimenopausal age group.

But Transvaginal sonography is first to be done in all patients with AUB, in case of suspicious endometrial lesion, patient may be subjected to hysteroscopy and guided biopsy.

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PROFORMA

Name: Age: Ip no:

Address:

Socioeconomic status:

Parity:

Last child birth:

Sterilised:

Last menstrual period:

Last normal menstrual period:

Menopause -------- years

PREVIOUS MENSTRUAL CYCLE:

----------/---------days

Regular/irregular

Scanty/moderate / excessive

Pain + / -

Clots +/ -

PRESENTING COMPLAINTS:

1. Bleeding p/v----------for----------

Scanty/moderate / excessive

Pain + / -

Clots +/ -

2. Abdominal pain: + / - for ----------
3. White discharge: +/ -

   Scanty/ excessive

   Colourless/dirty / serosanguinos

   Foul smelling + / -

   Itching

PAST HISTORY:

HT/ DM/ Thyroid / bleeding diasthesis / blood transfusion / history of oral contraceptive usage / hormone replacement therapy

GENERAL EXAMINATION:

Anaemia

Pedal oedema:

Breast:

Thyroid:

Spine:

Height: Weight: BMI:

PR:

BP:

OTHER SYSTEMS:

CVS:

RS:

CNS:

ABDOMINAL EXAMINATION:

Mass + / - enlarged to ----------

Tenderness +/ -

Scar +/ -

Organomegaly +/ -

EXTERNAL GENITALIA:

S/E : cervix : Normal / Hyper trophic/ Polyp/Erosion.

P/V: cervix: pointing upwards / downwards

Uterus : N /----------, fornices:----------

P/R: nodules in the pouch of Douglas +/ -

Parametrium----------

INVESTIGATIONS:

Hemoglobin:

PCV:

BT:

CT:

Random blood sugar:

Blood urea:

Sr. creatinine

Blood grouping & Rh typing:

HIV:

VDRL:

HbsAg:

Thyroid function test:

ECG:

ECHO:

TRANSVAGINAL ULTRASOUND:

Uterus: size----------

Endometrial thickness:-----

Fibroid / polyp/ adenomyosis / others

Ovary:

Right:

Left:

HYSTEROSCOPIC FINDINGS:

Cervix:

Internal os:

Ostia:

Endometrium:

Fibroid / polyp / others

HYSTEROSCOPIC GUIDED BIOPSY:

MASTER CHART

S. NO	NAME	AGE	IP.NO	S.E	PARITY	MENO PAUSE	TYPE OF BLEED	DURATION			ANAEMIA	HT	DM	HYPO THYROID	BIOPSY	TVS	HYSTEROSCOPY
								<6M	6M-1Y	>1Y							
1.	AVADIYAMMAL	60	25675		P5L4	+	PMB	+				+			ATROPHIC	ATROPHIC	ATROPHIC
2.	OTCHAMMAL	43	28146		P2L2	-	HMF		+						PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
3.	REGINA	45	4745		P3L3	-	HMF		+		+				PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
4	PANDIYAMMAL	45	5343		P4L4	-	HMF		+						SECRETORY	SECRETORY	SECRETORY
5.	NAGAMANI	43	10853		P1L1	-	HPMB	+			+				PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
6.	MARIYAMMAL	43	11667		P2L2	-	IMB		+		+			+	PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
7.	MUTHULAKSHMI	40	16019		P2L2	-	FC	+							PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
8.	UMAMAHESWARI	43	19244		P3L3	-	HMF	+					+		PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
9.	KAMAYEE	40	20165		P2L2	-	FC			+					PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
10.	MURUGASWARI	42	25819		P2L2	-	HMF	+				+			PROLIFERATIVE	HYPERPLASIA	PROLIFERATIVE
11.	KALARANI	45	33115		P2L2	-	HMF	+			+				SECRETORY	SECRETORY	SECRETORY
12.	PANCAVARNAM	40	35354		P2L1	-	IMB		+						PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
13.	MUTHULAKSHMI	40	37652		P2L2	-	HMF	+							PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
14.	SELVI	43	37653		P2L1	-	IMB		+						PROLIFERATIVE	HYPERPLASIA	SECRETORY

15.	PARIMALA	44	37408		P3L3	-	HMF		+		+				PROLIFERATIVE	PROLIFERATIVE	PROLIFERATIVE
16.	KAUSTHIRI	46	37794		P4L4	-	IMB	+						+	HYPERPLASIA	HYPERPLASIA	HYPERPLASIA
17.	PATTUTHAI	55	**26179**		**P3L3**	**+**	**PMB**	**+**					**+**		**ATROPHY**	**ATROPHY**	**ATROPHY**
18.	NAGALAKSHMI	44	**3543**		**P3L3**	**-**	**HMF**			**+**					**SECRETORY**	**SECRETORY**	**SECRETORY**
19	SUMATHI	44	**8923**		**P3L3**	**-**	**HMF**			**+**					**PROLIFERATIVE**	**PROLIFERATIVE**	**HYPERPLASIA**
20.	LAKSHMI	55	**10841**		**P4L4**	**+**	**PMB**	**+**					**+**		**HYPERPLASIA**	**PROLIFERATIVE**	**PROLIFERATIVE**
21	PONMANI	43	**17283**		**P5L5**	**-**	**FC**			**+**		**+**			**SECRETORY**	**HYPERPLASIA**	**SECRETORY**
22	CHANDRA	40	**10842**		**NULLI**	**-**	**HPMB**		**+**		**+**				**PROLIFERATIVE**	**PROLIFERATIVE**	**PROLIFERATIVE**
23	VIJAYALAKSHMI	48	**12661**		**P2L2**	**-**	**FC**		**+**					**+**	**HYPERPLASIA**	**HYPERPLASIA**	**HYPERPLASIA**
24	LAKSHMI	57	**20859**		**P6L4**	**-**	**PMB**	**+**					**+**		**ATROPHY**	**ATROPHY**	**ATROPHY**
25	IRULAKKAL	43	**29418**		**P3L2**	**-**	**FC**	**+**			**+**				**PROLIFERATIVE**	**PROLIFERATIVE**	**PROLIFERATIVE**
26	MENNAMMAL	50	**30141**		**P2L2**	**-**	**HPMB**	**+**							**HYPERPLASIA**	**SECRETORY**	**SECRETORY**
27	PADMA	50	**30303**		**P4L4**	**-**	**IR**	**+**			**+**				**SECRETORY**	**SECRETORY**	**SECRETORY**
28	THANGA MANI	55	**46456**		**P2L2**	**-**	**PMB**	**+**				**+**			HYPERPLASIA	**HYPERPLASIA**	**HYPERPLASIA**
29	DHANALAKSHMI	41	**46456**		**P3L3**	**-**	**FC**	**+**							**SECRETORY**	**SECRETORY**	**SECRETORY**
30	KALIYAMMAL	60	**42882**		**P8L5**	**+**	**PMB**	**+**							**ATROPHY**	**ATROPHY**	**ATROPHY**

31	JENITHA	44	35522		P1L1	-	HMF	+			+				**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
32	SUBBULAKSHMI	45	45568		P2L2	-	FC	+							**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
33	MARY	45	47032		P3L3	-	HMF	+					**+**		**SECRETORY**	HYPERPLASIA	**PROLIFERATIVE**
34	RADHIKA	41	36801		P3L2	-	HMF			+	+				**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
35	SHANTHI	49	19286		P2L0	-	HMF		+			+			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
36	SHANTHI	45	3663		P2L2	-	HPMB	+			+				**HYPERPLASIA**	PROLIFERATIVE	**HYPERPLASIA**
37	LAKSHMI	42	19512		P4L2	-	HMF		+						**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
38	AMUTH BEGAM	50	4027		P2L2	-	HMF			+		+			**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
39	PETCHIYAMMAL	40	5224		P2L2	-	IR		+		+				**SECRETORY**	SECRETORY	**SECRETORY**
40	ELIZABETH	47	44865		P2L2	-	HMF		+				**+**		**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
41	KARUPAYEE	40	48114		P1L1	-	HMF	+			+				**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
42	VETHAMANI	53	3061		P4L1	-	HPMB	+			+	+			**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**

43	VIJAYA GOMATHI	42	3228		P2L2	-	HMF		+		+				**SECRETORY**	SECRETORY	**SECRETORY**
44	VELANKANI	42	276		P2L2	-	HMF			+					**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
45	JANAKI	40	28874		P2L2	-	FC		+						**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
46	SELVI	40	36776		P3L3	-	FC		+		+			**+**	**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
47	PAPPA	57	21816		P2L2	+	PMB	+							**HYPERPLASIA**	HYPERPLASIA	
48	NAGALAKSHMI	54	12037		P4L3	+	PMB	+				+	+		**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
49	KALIYAMMAL	62	27418		P8L8	+	PMB	+				**+**			**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
50	VIJAYALAKSHMI	50	10743		P3L2	+	PMB	+							**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
51	PALANIYAMMAL	60	18497		P4L2	+	PMB	+				**+**			**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
52	BOMMAI	42	38671		P3L3	-	HMF		+		+				**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
53	ANNAKILI	45	40351		P2L2	-	HMF		+						**SECRETORY**	SECRETORY	**HYPERPLASIA**
54	RAMUTHAI	41	41750		P1L1	-	HMF		+		+				**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
55	ANITHA	41	46332		P2L2	-	HMF		+						**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
56	LAKSHMI	50	46698		P2L2		HMF	+			+				**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
57	ALAGUPILLAI	45	43344		P4L3		IMB	+					**+**		**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
58	SELVI	40	36779		P2L2	-	HPMB	+							**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
59	BAKTHAR NISHA	42	6518		P3L2	-	FC	+							**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
60	LAKSHMI	47	48049		P1L1	-	HMF	+				**+**			**HYPERPLASIA**	PROLIFERATIVE	**PROLIFERATIVE**

61	MOOKAMAL	48	4904		P4L4	-	HMF		+						**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
62	MUTHUSELVI	48	16770		P5L5	-	IMB	+					**+**		**HYPERPLASIA**	PROLIFERATIVE	**HYPERPLASIA**
63	VASANTHA	45	17743		P3L3	-	HMF			+					**SECRETORY**	SECRETORY	**PROLIFERATIVE**
64	SURULIYAMMAL	45	43995		P5L5	-	FC	+				**+**			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
65	POONGODI	42	44357		P2L2	-	HMF	+							**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
66	VIJAYABHARATHI	42	3228		P2L2		FC		+						**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
67	JEYA	40	4126		P2L2		POST COITAL	+				**+**			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
68	PASUMPON	45	5478		P1L1		HMF		+						**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
69	UMA RANI	44	1366		P2L2		HMF			+					**SECRETORY**	HYPERPLASIA	**HYPERPLASIA**
70	MALARKODI	40	4126		P3L3		HMF	+						**+**	**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
71	BAKIYAM	50	1002		P3L2		HMF	+				**+**			**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
72	VANITHA	50	7303		P4L1		FC			+			**+**		**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
73	MALAR	44	31758		P2L2		PMB		+						**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
74	ESWARI	46	35916		P2L2		HMF	+				**+**			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
75	JEGATHA	49	41897		P2L1	+	PMB	+					**+**		**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
76	KOKILA	48	19287		P2L2		HMF		+		+		**+**		**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
77	PARAMESWARI	40	15485		P3L3		HMF		+			**+**			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
78	SELVI	40	27081		P2L2		HMF		+						**SECRETORY**	SECRETORY	**SECRETORY**
79	NAGAMMAL	40	5478		P2L2		HMF		+						**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
80	SURILIYAMMAL	54	167		P3L3		IMB	+			+		**+**		**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**

81	ARAMMAL	47	1096		P2L2		HMF	+				+			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
82	PETCHIYAMMAL	45	2632		P2L2		HMF		+						**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
83	VALLIYAMMAL	58	10865		P4L4		PMB	+			+	+	+		**CANCER**	CANCER	**CANCER**
84	NAGAKANI	52	10983		P3L2		IMB	+				+			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
85	ELIZABETH	43	54443		P1L2		HMF	+							**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
86	VIJAYA	45	13411		P3L3		HMF		+						**SECRETORY**	SECRETORY	**SECRETORY**
87	SELVAM	50	18352		P4L4		HMF	+			+				**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
88	DHINAMANI	43	21578		P4L4		IMB		+			+			**SECRETORY**	PROLIFERATIVE	**PROLIFERATIVE**
89	NAGARATHINUM	45	22773		P2L2		HMF	+							**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
90	SUNDARANANDAM	46	33637		P2L2		IMB	+			+				**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
91	JANAKI	45	22645		P2L2		HMF	+				+			**SECRETORY**	SECRETORY	**SECRETORY**
92	BANUMAYHI	55	22662		P2L2		PMB		+				+		**ATROPHY**	ATROPHY	**ATROPHY**
93	ANDAL	45	24529		P2L2		HMF		+		+				**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
94	RANI	44	26090		P5L4		HMF	+				+			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**
95	RAJESWARI	45	33576		P2L2	+	PMB	+			+		+		**HYPERPLASIA**	PROLIFERATIVE	**HYPERPLASIA**
96	MEENA	50	33616		P2L2		HMF		+						**SECRETORY**	HYPERPLASIA	**PROLIFERATIVE**
97	JEYALAKSHMI	47	34861		NULLI	+	PMB		+			+			**SECRETORY**	SECRETORY	**SECRETORY**
98	VELLUTHAI	52	36880		P3L3		HMF	+					+		**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
99	AYYAMMAL	46	39085		NULLI		HPMB	+			+				**HYPERPLASIA**	HYPERPLASIA	**HYPERPLASIA**
100	RAMUTHAI	43	40052		P2L2		IMB	+				+			**PROLIFERATIVE**	PROLIFERATIVE	**PROLIFERATIVE**

HMF-HEAVY MENSTRUAL FLOW HPMB-HEAVY PROLONGED BLEED; IMB-INTER MENSTRUAL BLEED; FC-FREQUENT CYCLES; PMB – POST MENOPAUSAL BLEED;IR-IRREGULAR CYCLES

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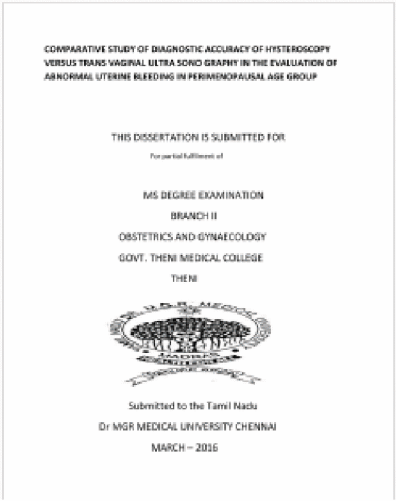

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